Full text of "La Cola Del Dragon América Del Sur on Old Maps, Medieval and Renaissance Artists Paul Gallez"

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— the Alexander von Humboldt Foundation

— the Directorate of Cultural Affairs of the Ministry of Foreign Affairs of the Republic of Argentina

— the General Directorate of Cultural Relations of the Ministry of Foreign Affairs

Exteriors of Spain.

Finally, I would like to thank the scientific journals that have already published some chapters of this book in a first draft. — the journal Karukinka of the Instituto de Investigaciones Históricas Tierra del

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— the Buenos Aires-based journal Ciencia e Investigación,

— the magazine Wiener Ethnobistoriscbe Blätter from Vienna,

— the journal International Journal of Cartography, from Bad Godesberg.

My deepest thanks go to all of you.

„,,... They thought that this part of the earth was an island and called it America, the fourth continent. Completely new voyages carried out in 1519 under the leadership of Magellan have shown that this country is Upper India, and therefore a part of Asia."

Johannes Schoener
Opusculum Geograpbicum, Pars Il, cap. 20 Nuremberg
1533

“The delusion of the Asian-American double continent enjoyed considerable popularity for some time. It would certainly not have been possible without inter
esse to follow more closely how long this fantastic idea lasted, and the z
to compare rich maps that reflect the same'

Franz von Wieser
Magalbies Strait and Austral Continent

on the globes of Jobannes Scboner

Innsbruck 1881

A whole century has passed since Franz von Wieser made this suggestion. I followed it and believe that I was the first to do so. Here I present the result of my work, the history of the representation of America as part of Asia. However, I am not satisfied with Wieser's question as to how long this idea lasted; I am looking for the causes in order to determine how long it has existed. And I prove that it did not spring from the imagination of cartographers, but that it proves that America was already known by Marinus of Tyre in the first century AD.

Bahia Blanca (Argentina) in August 1979 Paul Gallez

The prescient imagination, the all-animating activity of the spirit, which worked in Plato, in Columbus, in Kepler, must not be forgotten. On one of those maps, Mexico is shown as a neighbouring city of Peking, on another lies Gatigara (that old Ptolemaic city).

be accused as if she had been in the area — fen in Hinterindien) on the coast of Chile
science has created nothing, but these "bizarreries" or "gross errors"
By their very nature they necessarily deviate from the foundation of reality. — arose quite naturally in the field of the geographical conception of that time.
Alexander v. Humboldt: Kosmos II, 1847 JG Kohl to C. Ritter, London, 20. 8. 1854

The ancients knew America From
voyages of discovery that we will still discover An introduction by Prof. Dr.
Hanno Beck, Bonn

Prof. Dr. Paul Gallez, internationally known Belgian-Argentinian scholar and director of the Instituto Patagónico, gives a new twist to an old problem in this book. We have long known that South America grew out of Southeast Asia on maps and globes of the 15th and 16th centuries, naturally, like a branch from a tree, without this "dragon's tail" ever having been systematically investigated. It was seen as a temporary misrepresentation, nothing more.

Prof. Paul Gallez took these maps seriously. He proved their reality and rightly shook up a fixed view when he interpreted a map that had been published by a German cartographer three years before Columbus's deed. His investigation showed that cartographers before and after Columbus knew more about South America than Columbus, who only discovered the tropical subcontinent in 1498 during his third voyage.

This book is far from the usual historical explorations

. Capriccios by allowing the reader to participate in this argument.
We cannot escape this fascinating scientific problem. Paul Gallez introduces us step by step to the content-based evaluation of old maps and, supported by numerous illustrations, allows the reader to participate in his thinking. He is convinced of the identity of Dragon's Tail South America.

The reader will ask: How was it possible? How could cartographers before and after Columbus know more about South America than the explorer who was so influential in world politics? How did this cartographic knowledge reach Europe before Columbus?

We are faced with a problem that is not unknown in the history of science: we recognize a pre-existing knowledge, but we cannot (yet!) explain how it came about. Who discovered South America before Columbus? Is there a way today to at least secure traces of such voyages of discovery? I am convinced that sooner or later we will be able to travel on voyages that can explain the European level of knowledge outlined above.

will prove historically and, if we look closely, we are already more on their trail than the public suspects. Some of the possible lines of thought today are indicated, whereby emphasis is consciously placed on the opinion of other authors.

There are no “final results” in science. The history of America’s discovery cannot be fixed either.

Certainly the first discoverers of the double continent were the ancestors of the Indians and Eskimos, who migrated across the Bering Strait in 40,000 BC. Certainly the Vikings found North America from Iceland, as Helge Ingstad was able to prove archaeologically. Certainly Columbus's deeds led Europe to America, ushered in the modern era, and made a new state system and a new world view possible.

Is this all?

In 1969, the Bonn scholar Lienhard Delekat proved that South America had been discovered earlier by Phoenicians in the 5th century BC.'

If conclusions are drawn from the history of travel, further discoveries of America from Asia can be proven sooner or later. Here too, the public has not noticed how much the classical idea of travel history has been revived and slowly changed.

The internationally renowned Bonn ethnologist Prof. Dr. Hermann Trimborn wrote in 1961:

,We also lack any source evidence for early travel between the coasts of Asia and America — but the many similarities that exist in many areas of life between the advanced civilizations of the Indians and those of eastern and southeastern Asia make early overseas voyages of

the coasts of Cambodia and China to the shores of America to an almost probability bordering on certainty'*.

However, these and other well-founded assumptions were far less noticed than the certainly worthy Kon-Tiki expedition of Thor Heyerdahl in 1947, which was intended to demonstrate the possibility of a double settlement on Easter Island. According to him, the oldest settlement was in Peru, namely by a branch of the Tiahuanaco culture, which had covered 2000 km of the American Pacific coast. Only the more recent settlement was achieved by the Polynesians from the west, who found the island inhabited by the descendants of these even older sailors. The research success of the German ethnologist Thomas Barthel was disputed by Heyerdahl.

Despite all the outward recognition of Thor Heyerdahl's achievements, some cells in the scientific community are convinced that this undertaking is suspect in its consequences. The Norwegian has been active in science since the 1930s, and if one looks at his entire work, one cannot deny that it represents a considerable enrichment.

The idea that the Indians came across the Bering Strait and then developed in isolation on their double continent until the Europeans arrived has often become dogma. Little by little, the idea of discoveries and cultural influences long before Columbus broke through. Early journeys from Asia across the Pacific to America are possible, as are ventures from America towards the Pacific islands and advances by the Mediterranean-Oriental culture towards the New World. With regard to America, there is not just one direction of discovery, but two. Thor Heyerdahl himself thinks more of an early connection between the Old World and America, and there is undoubtedly remarkable historical and archaeological evidence for this. The conquistadors were actually favored because the Indian advanced cultures saw them in connection with white and bearded gods. Unfortunately, the Spanish destroyed some of the most important monuments that the Indians had erected for them; but we know that the white conquerors themselves recognized in these works a similar image of man

and occasionally in the Inca region a cult of Saint Bartholomew was based on such a representation. The preserved evidence and archaeological finds reinforce this opinion, as we can often identify an older than the actual Indian class with two different types of people, a long-headed, light-haired one and a round-headed, dark-haired, Southeast Asian one."

Often the problems have overlapped as a result of the two conscious possibilities of discovery.

Located on the Elena Peninsula, 160 kilometres west of Guayaquil (Ecuador), The oldest pieces of pottery excavated (figures and vessels) are over 6000 years old and have not yet been found anywhere else in the Western Hemisphere. The earliest cultivation of maize was probably also found here.

“Culture experienced a decisive change around 500 BC, which ceramics

of the Bahia culture. Its people created lavish gold jewelry for their ears, lips and noses, and their house shapes (East Asian gable roofs, people with beards, occasionally in yoga poses) testify to an early connection between Asia and America? .

Thus a rigid pattern has been dissolved, the abandonment of which is perhaps only difficult for us Europeans because we think in terms of modern world traffic. As people who have largely forgotten how to walk, we see too many difficulties, as Thor Heyerdahl has repeatedly pointed out. The old travel books from the 19th century alone document the distances that a "trademan" could cover, and life stories from times gone by show that contemporaries knew of convenient ways and shortcuts. Men like Thor Heyerdahl and the American Admiral Samuel E. Morison? have contributed a great deal to the nautical research of ocean currents. Much of it only becomes understandable in the light of their practical nautical experience.

The "transport belts" demonstrated by Thor Heyerdahl in the Pacific and Atlantic were certainly very effective. Nevertheless, they do not explain everything. The Norwegian scholar seems to me to absolutize his nautical ventures, which were planned according to modern knowledge. Of course, discoveries were also made outside of favorable currents. The study of "defections," ie involuntary voyages that could not yet have known their destination, provides some very remarkable examples.

As early as 1890, Otto Sittig had recorded a considerable number of such incidents in the Pacific and had also mapped four areas of wreckage; he had also noticed voyages going against the currents.

In 1916 and 1921, the ethnologist and historian of discovery Hans Plischke pointed out the important fact of the arrival of individual natural products, artifacts and shipwrecked people from the still unknown worlds of the (American) West on familiar European coasts. These exciting events naturally gave contemporaries something to think about and contributed more to the awakening of the European urge for discovery than can be deduced from previous accounts.

From 1782 to 1863, as far as the landings are known, 41 Japanese ships, often with living passengers, arrived on the Pacific coast of America; between 1850 and 1863 alone there were 28 vessels.

Beatings could have very serious consequences'®.

Until modern times, it was common practice to keep important voyages of discovery secret, as we unfortunately have to say today. The Phoenicians were masters of this, probably the people with the greatest and earliest energy for discovery, to whom we owe not only the first circumnavigation of Africa, the first major Atlantic voyages and the reaching of many Atlantic islands as springboards to greater successes, but also the earliest discovery of America and Australia from the Old World.

On July 8, 1970, a report from the overseas service of the German Press Agency came as a surprise, according to which America had been discovered by Asian travelers. On July 7, 1970, the Soviet news agency TASS reported that two Leningrad scholars, Lev Gumilow and Bronislaw Kuznetsov, had "discovered while interpreting very old maps in Tibetan books .

. . , Asian travellers may have been there as early as 1500 BC.
were aware of the existence of the American continent.

The Tibetan maps were already known to the Orientalists, but they had previously considered them to be products of the imagination. It was only the investigation of the old Tibetan and Indian place names that led the two scientists to take the old maps seriously. According to this investigation, the purely American word tobacco had already found its way into numerous oriental languages in ancient times, long before the discovery of the New Continent by Columbus or the Vikings. According to the scientists,

According to scientists, the allusion in the Tibetan books to a 'green land lying 'far beyond the eastern sea' can only be related to the American continent.

The present work by the Belgian-Argentinian scholar Paul Gallez aims to show that an early discovery of America from Asia was reflected in the maps of the Orient and Europe.

We have seen from what has been said so far that a discovery of the New World from Asia via the Pacific is very probable. If Europe has heard of this, we must look for a possible connection. Where could it be found?

Surprisingly, the Bonn scholar Richard Delbrueck has done excellent preparatory work on behalf of the German Research Foundation when he investigated South Asian seafaring in antiquity from the 4th/3rd millennium BC to the Roman Empire and, in doing so, created a colorful, objective picture of travel history!?

If you look at the world map, it is clear that the European Mediterranean, the Red Sea, the coastal Indian Ocean from Arabia via the Foreshore,
India and Insulinde could become the main long-distance transport route of antiquity;

Nature itself had opened up a path that made it possible to reach East Asia by coastal shipping. Delbrueck was the first to evaluate a literature that had long been known in detail and to prove that Phoenician, Greek and Roman captains had a far better knowledge of the world than was previously assumed. The Orient (especially the Phoenicians) and the West had already penetrated the Caribbean-Pacific coast before the birth of Christ, and Marco Polo was not to become the "Columbus" or momentous discoverer until the end of the 13th century. Delbrueck himself has put his evidence together.

. chain put together link by link without any intention of sensationalism.

When Orientals and Europeans came to Arabia, India and China before the birth of Christ, they had to learn more from their trading partners than the scholars of these cultures knew. Thus, the discoveries of the East Asian advanced civilization could reach Europe in various ways, including through the mediation of Indian and Arab geographers (and cartographers). |

A gifted travel historian like Alexander von Humboldt was deeply convinced of early connections between Europe and Asia along the path just described. In his "Cosmos", the bestseller of the 19th century, he demonstrated a great deal of knowledge in his presentation of the expansion of the world view, which Delbrueck also relied on: the Ptolemies had used the Red Sea route marked out by nature from Alexandria (Egypt) "with unprecedented success" (maritime trade with the Indian subcontinent). The Romans expanded on the inspiration of Hellenism: under the reign of Emperor Claudius (10 BC - 54 AD) the embassy of Rachias from Ceylon was said to have travelled via Egypt to the Mediterranean.

reached Rome. Under Marcus Aurelius Antonius (176-217), whom the historians of the Han Dynasty called "An-tun", Roman legates appeared at the Chinese court; they had come by sea via Tonkin. The works of Ptolemy and Strabo testified to the progress of traffic. Strabo himself observed in Egypt the large number of ships sailing from Myos Hormos directly to India; his imagination led him beyond India to the eastern coast of Asia. He suspected the existence of the New World; Humboldt was surprised that this observation had not been noticed by the Spaniards of the 15th and 16th centuries, who were searching for sources. H. |

More than 100 years ago, Alexander von Humboldt pointed out the connection between Rome and China in his "Kosmos" as a matter of course. Richard Delbrueck confirmed these facts and made a larger connection visible for the first time by recognizing a way in which we can already imagine the transmission of very early knowledge of the discovery of the New World.

Which route did East Asian explorers probably take in prehistoric times?

Following Heyerdahl's example (1947), twelve manned raft trips from the Pacific coast of South America to the west were carried out between 1954 and 1973: two only reached the Galapagos Islands, 10 came to Polynesia, 5 sailed further to Melanesia and - to Australia!

The journey from Southeast Asia and China to America was attempted far less frequently:

Even before the Second World War, Eric de Bishop failed when, in a three-year venture, he was unable to sail a Chinese junk to Melanesia, let alone Polynesia. In a Polynesian canoe, however, he sailed from Hawaii to Polynesia in just a few weeks. When, after the Kon-Tiki voyage (1947), he tried again, this time with a bamboo raft, and wanted to exploit the band of the "good westerly winds," he failed again. Therefore, a particularly carefully prepared venture by a student of the highly esteemed Viennese scholar Robert von Heine-Geldern must give us food for thought:

In 1974, after six years of preparation, Kuno Knöbl wanted to steer an authentic junk from the South China Sea to Ecuador (Tai Ki voyage). However, the vessel drifted north and traveled two-thirds of the way from Asia to America in the Kuroshio current from June 18th to October 9th, 1974. The junk, built after a 1500-year-old model, was unfortunately destroyed by borers and had to be abandoned.

However, this journey achieved an important result and once again confirmed the importance of the caraval route discovered by Fray Andres de Urdaneta in 1565. The wreck of the Jungle, abandoned by Knöbl's crew,

ke Tai Ki drifted along the coast of Alaska. This route was probably discovered and tested by early explorers. Once they had reached the American coast from Alaska to British Columbia (Canada), the rest of the journey could follow the guideline of the littoral.

Finally, I would like to thank the young historian of geography and travel, Mr. Wolf-Dieter Grün, for his good cooperation. Mr. Grün not only translated the French manuscript of my colleague and friend Prof. Paul Gallez into German, but also accompanied this work with valuable explanations and also gave me suggestions for this foreword. In some cases he also procured better models for the illustrations, for which he deserves recognition.

May the book, which discusses the history of the discovery of America in a new way, also be discovered by the readers.

Bonn, 24. 3. 1979 Hanno Beck

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On this subject, see Hermann Trimborn: Ancient American Civilizations. In: The Great Illustrated World History. Gütersloh 1964, Vol. I, p. 1017 ff.

? Helge Ingstad: The first discovery of America. On the trail of the Vikings. Berlin 1966; the Norwegian original edition: Vesterveg til Vinland. Oslo 1965. — In the books of Jacques de Mahieu, the Vikings have been given too great qualities as explorers: Who discovered America? Secret geography before Columbus. Tübingen 1977; ibid.: The sun god's great journey. The Vikings in Mexico and Peru 967—1532. Tübingen 1975? ; individual arguments and interpretations are certainly worth noting. — I have always been inclined to support the possibility of an Irish discovery of America and do not know whether I am right to stop there. Is there perhaps something at the core of the "Navig

“tio Sancti Brandani” is there some truth in it? The coracles, “primitive but incredibly seaworthy Boats made of wickerwork covered with skins were quite useful vehicles; see the remarkable and little-seen book by Ian Cameron: They sailed for the evening star. A history of first discoveries. Stuttgart 1968, p. 86 (reference by Mr. WD Grün). — A rich book by Constance Irwin is worth considering: Columbus came 2000 years too late. Vienna 1963; but above all Timothy Severin (A Thousand Years Before Columbus, Hamburg 1979), who practically tested the seaworthiness of an Irish boat, covered 3500 nautical miles from Ireland and reached the coast of Peckford Island (150 miles northwest of St. John's, the capital of Newfoundland) on June 26, 1977.

* Lienhard Delekat: Phoenicians in America. The authenticity of the Canaanite (Old Sidonian) inscription from Paraiba in Brazil, discovered in 1873, proven. Bonn 1969 Bonner biblische Beiträge, 32. — The author has refined these statements in further publications: Une nouvelle copie de Paraiba. In: Linguistica Biblica No. 15/16.

1972, pp. 22—30, with addendum p. 90 and Parahyba inscription—new readings and comments on Cross's defense of inauthenticity. In: Linguistica Biblica No. 33. 1974, pp. 1—13.

^ Hermann Trimborn: Eldorado. Explorers and gold seekers in America. Munich and Vienna 1961, p. 10 - Janus Books. Reports on world history.

5 Thor Heyerdahl: Expedition RA. Giitersloh and Vienna 0.J., pp. 22, 32, 38. The two RA expeditions have proven the possibility of crossing the Atlantic in papyrus boats. — A good overview of all of Heyerdahl's ventures is provided in the book: Between the Continents. Archaeological Adventures. Munich 1975.

$ Thomas Barthel: Fundamentals for the decipherment of Easter Island writing. Hamburg 1958 - University of Hamburg. Papers on foreign studies, vol. 64, series B. Ethnology, Cultural History and Languages, Vol. 36; the volume corresponds, with minor corrections, to the author's habilitation thesis; Thor Heyerdahl rejects this: Wege iuber Sea. Migrations in the early period. Munich 1978, p. 326 f.

? Thor Heyerdahl aaO 1975, p. 83 ff.

8 Peter Baumann: Valdivia. The discovery of the oldest culture in America. Hamburg 1978.

° An important addition is provided by the Swede Björn Landström, who created the most historically accurate drawings of early explorer ships and their historical environment: Knaur's Book of Early Voyages of Discovery in Colours. Munich 1969; Landstróm also created thorough sketches for the construction of the first papyrus boat of Thor Heyerdahl's expedition.

10 Otto Sittig: On involuntary migrations in the Great Ocean. In: Petermanns Mitteilungen 36, 1890, pp. 161—166, pp. 185—188, with map: plate 12, after p. 208 (I am grateful to Mr. WD Grün for pointing out this rare article); Hans Plischke: Deportations of inhabitants of America to Europe in antiquity and the Middle Ages. In: Petermanns Geographische Mitteilungen 62. 1916, pp. 93—95; ibid.: A deportation of Eskimos to Holland in 1577. In: Petermanns Geographische Mitteilungen 67. 1921, p. 125; washed-up natural products and artefacts (such as carved wooden strips) were known to Columbus even before he began his voyage. Plischke also reported on driven Eskimos around 60 BCE. 1160 in Lübeck, 1508 in Rouen, 1577 in Holland (two kayaks with Eskimos, one kayak has been preserved). — Paul Gaffarel: History of the discovery of America since the origins up to the death of Christophe Colomb. Paris 1892, p. 170 and Lienhard Delekat ibid 1972, p. 27.

!! dpa-Überseedienst/Ausl. Korr. of July 8, 1970, p. 4. I have to thank Mr. Counselor Peter Schoenwaldt, who was then in the Cultural Department of the Foreign Office in Bonn, for this tip. The report was hardly picked up by the German press.

12 Richard Delbrueck: South Asian Seafaring in Antiquity. In: Bonn Yearbooks of the Rhineland State Museum in Bonn (in the Rhineland Regional Association) and the Association of Friends of Antiquity in the Rhineland. Issue 155/156. 1955/56, pp. 8-58 and 229—308.

13 I will first quote from the original edition of the “Kosmos” (Stuttgart and Tübingen 1847, II, pp. 202, 204, 221, 223; on p. 463 Humboldt refers to Johann Schóner, who in 1533 claimed that the New World was part of Asia and that the city of Mexico conquered by Cortez was the Chinese city of Quinsay [Hang-tschou] enthusiastically described by Marco Polo), although it will probably only be accessible to a few readers, then from the “Kosmos” edited by me (Quellen u. Forschungen zur Geschichte der Geographie und der Reisen, No. 12) Stuttgart 1978, pp. 333, 334 f., 348, 349 £.). — In contrast, a motto

This introduction was given to Johann Georg Kohl, who could only see "bizarreries" in the hints and premonitions of a new world view of the ancients: "If one studies the maps, one has enough opportunity to see that even in folly, as Shakespeare says, there is method"; From a letter from Mr. JG Kohl to Mr. C. Ritter. In: Zeitschrift für Allgemeine Erdkunde 4. (Dietrich Reimer, Berlin) 1855, p. 3

—337; here p. 335 (notes by Mr. WD Grün); additional modern discussion by Hans-Günther Gierloff-Emden: Geographical conditions of early seafaring and population expansion in the Pacific Ocean. In: Communications of the Geographical Society in

Munich 64. 1979, pp. 217-253, computer-calculated diffusion models, the visibility screen of islands, the influence of tropical cyclones on Polynesian shipping are discussed. — Hanno Beck: Germania in Pacificio. The German contribution to the development of the Pacific Basin. Wiesbaden 1970 = Akad. d. Wiss. ud Lit., Abh. d. Math.-Naturwiss. Klasse, Jg. 1970, No. 3.

I. Early cartography of South America

Where knowledge ends, hope
and discovery begin
Armando Cortesao

I.1 Early cartography*

The title of this work requires some introductory explanations in order to define for the reader the limits of the subject matter being treated: temporal limits, limits of the scientific field being dealt with and also limits of the credibility and probability of the theses being put forward.

Early cartography is a science that is rarely talked about.
What is already known in the scientific world under the name of the 'Argentine School of Early Cartography' is a group of researchers working independently and comparing their results at different intervals:

— Professor Enrique de Gandia, — Professor
Dick Edgar Ibarra Grasso and the author.

These are the three “Knights of the Dragon’s Tail”.

Early cartography is often linked to early history. Just as history reports on events of which we have relatively reliable written evidence, which it studies, analyses, compares and discusses, early history examines events of which we only know through indirect evidence, through not always very clear clues or through documents which, in and of themselves, lack credibility, for example if their author had an interest in distorting the truth, or because we do not know the date, author or recipient.

Early history includes the entire period of early voyages of discovery: for example, secret expeditions sent out by a king who feared that his rivals might learn of the results, or ventures by private individuals who wanted to keep the benefits of the discovery for themselves. I speak here of benefits, because there can be no glory for a discovery that must remain secret, and this benefit is always very meager compared to the sacrifices made and the risks taken.

If such a journey is well documented, it will be part of history. If we know nothing about it, apart from a few dubious details, if these discoveries

* The author's notes are purely bibliographical. The first number in italics refers to the corresponding number in Chapter XVI: Bibliography. The following numbers indicate volume and page numbers.

The notes marked 1,2, etc. are by the editor and translator.

If the interpretation is no more than "possible" or "probable", then it belongs to early history. The task of early history is then to look for other evidence and data that support each other and allow the development of a probable and acceptable interpretation. This has at least the value of a working hypothesis if conclusive proof is not achieved.

This is the case with many voyages to America made before Columbus and with expeditions to the Patagonian Strait before Magellan's voyage. Many archaeological and cartographic facts indicate that the Mediterranean world had some knowledge of South America long before the official discovery. But the voyages which made this knowledge possible are so poorly documented that we generally know neither the date of their departure from Europe nor that of their return, nor the places reached in the New World, nor the name of the captain or shipowner. Because of the lack of information, these voyages are not included in the history of discoveries, but in their early history.

This is closely linked to early cartography, a science that deals with old maps that require interpretation because they apparently contain inexplicable information or serious errors and distortions, and their reading raises doubts.

When a secret expedition returned to the motherland, both the captain and the sailors were required, under threat of the death penalty, to keep complete silence about the geographical location of the areas explored, their riches and all details of the voyage. Portugal in the 15th century is particularly known for this policy of secrecy, but it was also common in Spain and other seafaring nations.

The official cartographer was privy to the greatest secrets and had to practice the greatest secrecy. The geographers who were not members of the court could only learn of the new discoveries through indiscretions. In general, the captain was cautious because he knew the danger he was running if he talked too much. To obtain a description, albeit a summary and often erroneous one, of the new territories beyond the seas, the only available sources were the stories of the sailors, who, often spurred on by alcohol, had the audacity to boast of thousands of real or imaginary adventures. But they generally knew neither the lengths nor the widths reached, but they exaggerated the cold and heat endured and described the natives in monstrous pictures.

The weeks and months they had spent without seeing land, without fresh water and without fresh food were multiplied in their reports.

What could one believe about these bar stories? How should one interpret this seaman's yarn in order to translate its content into geographical maps?

The task of the cartographers was very difficult. They had to sharpen their critical sense in order to separate in these reports the false from the true, the appearance from the reality, the fruits of imagination from those of observation. They sifted the information about unknown areas in the light of their own geographical ideas and did their utmost to show on their maps the result of their reflections.

In spite of so many obstacles and difficulties, South America had been mapped with astonishing accuracy before it had even been officially discovered. The accuracy is so great that in many cases it is impossible to attribute the cartographers' information to simple reports from sailors or even captains or helmsmen! Certain facts could only be recorded by excellent astronomers and cartographers, which leads to the assumption of large expeditions carried out by powerful states.

Why does history know nothing of such expeditions? For the simple reason that not a single document mentions them and only a few legends from antiquity and the Middle Ages contain some allusions to great voyages across the sea. This is of course insufficient for a historical analysis. It can be assumed that the states that carried out such expeditions wanted to protect the secret of the sources from which they obtained gold, precious stones, precious woods, slaves, spices, perfumes, etc. When civilizations were completely destroyed, their legends and traditions were lost, but some of their secrets may have been transmitted by geographical maps and thus survived until previously discovered areas were rediscovered.

Early cartography studies and interprets these maps and often notes their excellent quality. Early history attempts to hypothetically reconstruct the expeditions that provided cartographers with these geographical data. These two sciences solve some problems and raise many new ones for which no solution can be offered today.

In many cases, early cartography and early history complement and intertwine in a kind of spiral. A secret or an official expedition, the results of which had to remain secret for political reasons, made discoveries that were reproduced on the maps for better or worse; this is an advance in early cartography. In turn, what was added to the map invites us to send out an expedition, secret or not, to confirm this alleged discovery by a perhaps boastful captain and to find out what there is beyond the islands and countries that cartography has just begun to depict.

' At that time, the helmsmen, called pilots, were responsible for navigation.

1.2. Credibility and reliability in early mapping

Historians usually work with relatively reliable documents. This is why they make a professional mistake: when faced with the interpretation of an early map, they immediately ask for proof! This is clearly a mistake. If there were proof, we would be in the field of history or cartography. It is precisely because there is none that we are dealing with early history or early cartography. What can be demanded is the formulation of theses that are as consistent as possible. These can be consistent or alternative, and therefore they complement each other or exclude each other.

According to Armando Cortesão, "it is not enough to deny and criticize. More important than systematic denial is continuous research. It is more valuable to hope than to doubt, and it would be disastrous if the historian, the philosopher, the scientist were to abandon intellectual speculation within certain limits simply for fear of being mistaken or criticized. The history of philosophy and science shows that no theory can be considered definitive" (27 11195).

On the other hand, early cartography does not work with imaginary maps. It examines and interprets real-life representations of areas that had not yet been officially discovered at the time the maps were drawn up, and it acknowledges the distortions of known areas that normal cartography simply labels as "errors" without attempting to explain them.

Enrique de Gandia wrote: 'One can deny on principle, blindly, but not in a scientific spirit. We await with composure the attacks, the pity or the indignation, the skepticism or the indifference. It will be very difficult for the old scholars to change fundamentally their deep-rooted and petrified beliefs, which have existed for centuries' (69 43).

Although it has few followers, early cartography is today a dynamic science in full development. It is not aimed at the "ancient scholars" but at scientists with a fresh spirit, passionate about the progress of their subject and ready to take the risks inherent in exploring untouched paths. We know very well that it is necessary to put forward ten interpretations, to analyse them and to subject them to criticism before one of them is found to be correct. We know that scientific progress consists in replacing a moderately satisfactory explanation with another that is better.

and we also know that this new "scientific truth" will later be overthrown to give way to a third "scientific truth" containing fewer inconsistencies than the previous one.

Scientific progress is like the Echternach procession: three steps forward and one back. And even this comparison can be said to be too optimistic. False interpretations, partial failures, doubts and corrections are completely inevitable, because they are part of scientific work. Therefore, these adversities do not discourage the researcher. If he finally develops a hypothesis that turns out to be fruitless, this experience is positive, because it at least reduces the number of paths still to be explored.

Armando Cortesáo once again: “Where knowledge ends, hope and discovery begin” (26 15).

Thanks to his error in estimating the circumference of the Earth, Columbus searched for Asia across the Atlantic and found America. He was considered a madman, like all scientific pioneers. Those who wanted to fly were also madmen until the invention of the airplane. Those who wanted to go to the moon were madmen until the flight of Apollo 11. The early cartographers were also sometimes called mad, as were all those who set out to search for scientific knowledge for which their time was not yet psychologically prepared. Blessed be this madness which, as Erasmus put it, "preserves youth and drives away the burdensome old age"! (49 XIV).

1.3. Antonio Galváo and the Dragon's Tail

It is now time to end these general considerations and approach the topic:

The early cartography of South America is the story of the dragon's tail and its cartographic representation. This type of representation stopped in the third quarter of the 16th century. But when did it begin? This is one of the

. Main subjects of this investigation.

What exactly is this 'dragon tail'?

On numerous world maps published in the 16th century, South America forms a huge peninsula, which is connected to the Asian continent, or more precisely to China, in the northwest via the Central American Isthmus. Traditionally, China is represented by its millennia-old symbol, the dragon. The large peninsula that represents South America forms the tail of the Chinese dragon. This is the name that Antonio

Galväo in his treatise on the ancient

and new discoveries (64), which is also called Tratado after the first word of the title.

Antonio Galväo (d. 1557) is a very interesting personality. His book on the history of discoveries is a milestone in this field and represents a first-class source for early history and early cartography. Antonio Galväo is not only a historian, but also a military man, an administrative official, a sage and a saint.

Most of the Portuguese conquerors who distinguished themselves during the reign of Manuel the Great? from 1495 to 1521 were very poorly remunerated for their outstanding services. The king wanted to preserve the glory of the discoveries and the prestige of the conquests for the crown and, not least, the profits from the spice trade.

The great men of his era all fell victim to his own egoism: Barto-lomeu Diaz, who discovered the Cape of Good Hope; Vasco da Gama, who led the first Portuguese squadron to the Malabar Coast; Pedro Alvares Cabral, who officially discovered Brazil; Francisco de Almeida, who conquered the Malabar Coast; Alfonso de Albuquerque, the conqueror of Malacca. The same happened to Antonio Galvão, the "Apostle of the Moluccas", the first governor of these islands.

After returning to Lisbon after the expiration of his mandate, Galväo fell ill, became a Franciscan and died in poverty in 1557.

His father, Duarte Galvão, was secretary and official historian of the kings of the House of Avis: Alfonso V the African (1438-1481), John II the Perfect (1481-1495) and Manuel I the Great (1495-1521), so his son was well placed to know the secrets of the Court of Lisbon and the Naval School of Sagres, where the great Portuguese sailors had been trained since the establishment of this institution by Henry the Navigator (1394-1460).

Six years after the death of Antonio Galvão, his famous Tra-tado (64) was published by his friend Francisco de Sousa Tavares, a former captain of the "Indian Fleet". There one can read the account of the journey of the Infante Dom Pedro of Coimbra, the son of the Master of the Order of Avis, John I (King from 1385 to 1433) and brother of Henry the Navigator, in England, France, Germany, the Holy Land, Hungary and Italy. Dom Pedro, the later Regent of Portugal, is said to have brought back a world map from Rome or Venice in 1428, which showed the "entire surface of the earth" and "the Strait of Magellan in the tail of the dragon".

Readers of the 16th century had to understand this exactly as Galväo meant it, because numerous maps of that time depicted South America as the tail of the Chinese dragon.

The Strait of Magellan was fairly well known in 1563, the year in which the Tratado (64) was published; it had already been navigated by the fleet of Haro in 1514 (53), by Magellan in 1520, by the fleet of Loaysa (Loaisa) in 1526, by that of Camargo in 1540, and by Ladrillero, coming from the Pacific, who was the first to navigate it in both directions in 1558. All of these navigators, except Magellan, had encountered tremendous difficulties at this point and had suffered considerable casualties in men and ships.

2 Manuel I, Manoel o Venturoso. * 1469 - 1521.

South of the strait lies Tierra del Fuego, which was imagined to be united with Terra Australis Incognita, which was supposed to include the entire Antarctic continent, present-day Australia and the land areas in the southern Indian Ocean that only existed in the imagination.

The passage of the Drake Strait by this English navigator in 1579 (208) and the discovery of Cape Horn by Le Maire in 1616 were not enough to change this geographical idea, because the States Island was considered part of the Antarctic continent until Brouwer circumnavigated it to the east in 1643.

The Dragon's Tail continued to dominate the southern hemisphere until 1574, as we shall see in the following chapter. Only since then do Galväo and his Dragon's Tail seem to have sunk into oblivion, while the Infante Dom Pedro and his strange world map have been dismissed as medieval fantasies - very unjustly, as we shall see.

The problem of early cartography to which I have devoted this study is the origin and history of this geographical concept that formed the dragon's tail from South America.

In search of an answer I will go from card to card in time

because I know that cartographers - and not only them - often find their most important information in the works of their predecessors. They only change and add what they have arrived at through their own research or reflection, as well as the information they have acquired while preparing their work.

II. The dragon’s tail on the maps of 1574—1553?

II 1. The Ptolemy Maps

On many maps, South America forms an Asian peninsula that is connected to the Chinese mainland via the Central American Isthmus. I will only pick out the most important ones here, because the others are simple copies of them and often bad ones at that.

The last known map connecting South America with Asia is the world map by Giulio Sanuto, published as an appendix to a geography of Ptolemy translated from Greek into Latin by Girolamo Ruscelli and later revised and improved by Giovanni Malombra. This edition was published in Venice in 1574 (183 137 and 291).

We will encounter Ptolemy many times in the course of this book, and an entire chapter is dedicated to him. Although he made the mistake of abandoning the heliocentrism of his predecessors and returning to the geocentric system, the influence of his geographical works, especially his world map, named after him the Ptolemy map, was great until the 17th century. He lived in Alexandria in the 2nd century and wrote several scientific

Works. We are only interested in the Geograpbike Hypbégesis or Instructions for Drawing a Map of the World, traditionally known as Ptolemy's Geography. Like most scientific works of antiquity, Ptolemy's works, especially his Geography, remained unknown in the Christian world of Western Europe for most of the Middle Ages. His memory, however, was preserved in the monasteries of the Eastern Roman Empire, especially in Constantinople and Greece, where the copyists did not limit themselves to copying the manuscripts of the Geography: they often took the liberty of updating the original text, improving the model and adding what they felt was lacking, which was not always particularly informed by their own expertise.

Fortunately, each copyist made changes according to his own personal ideas and the comparison of the surviving manuscripts allows us today to reconstruct the original text to a certain extent.

Since the 9th century, Ptolemy's Geography has been translated into Arabic in the Dar al Hikma, the House of Wisdom, ie the Great Library of Baghdad. The translators from Baghdad took even more liberties than the copyists from Byzantium.

In 1410, the Italian Jacopo d'Angelo, sometimes called "de Scarperia", the Latin translation of Geograpbiké Hypbégesis as

° For necessary reasons arising from the text, the presentation according to the

Hellmut Diwald's expression is "counter-chronological" and advances from younger and worse to older and better cards.

his own work, but in reality it was made by his late teacher, the Greek Manuel Chrysoloras, embellished with numerous errors, which are generally the work of d'Angelo himself (40). At the end of the 15th century this translation was spread in Western Europe by the printing press, despite the protests of contemporary scholars. Among them, Erasmus of Rotterdam (1467-1536) demonstrated his opposition by publishing the Greek text of Ptolemy in Basel in 1532 (38).

11.2. Giulio Sanuto’s map from 1574 (Fig. 1)

Giulio Sanuto's map is not a representation in the sense of Ptolemy, but a world map, ie the representation of the entire surface of the earth in two hemispheres. This system does not seem to be applicable as long as large areas of the earth have not yet been discovered.

Nevertheless, it was used since the fifth century by Ambrosius Aurelius Theodosius Macrobius (ca. 395—436) in his commentaries on Scipio's Dream (134). There Macrobius drew a world map which could be described as very abstract in order to illustrate his conception of the division of the earth into four parts (183 26—39).

On Sanuto's map, South America in general has a shape that differs greatly from reality, especially in the southern part. The breadth of the continent is about 50 degrees longitude at 35° S., whereas its real breadth is not more than 15°. From there the continent becomes increasingly narrower towards the south and ends at 53° S. with the Strait of Magellan, where it actually is. South of this, Tierra del Fuego has approximately the correct size, although the cartographer gave it a square instead of a triangular shape.

The river network on this map is poor. The Paraná system is reasonably well drawn on the basis of Spanish and Portuguese expeditions. The Amazon, which Orellana had sailed down in 1541, and the Orinoco, which Columbus had already discovered, seem to have been unknown to the cartographer. i

Sanuto does not mark any river between the Rio de la Plata and the Strait of Magellan, although Magellan's fleet had discovered the mouth of the Rio Deseado (under the name Rio de Juan Serrano) and the Santa Cruz, near which Juan Serrano had been shipwrecked, in 1520.

Exactly in the middle of South America you can read the inscription: AMERICA ASIAE PARS, America part of Asia, as also shown by the union of the two continents between 48° and 70° N on this world map.

The part of North America south of the 48th parallel is approximately correctly marked. You can clearly see the peninsulas of Florida on the Atlantic side and Baja California on the Pacific side.

The part of China that connects with present-day Canada bears the mark TERRA INCOGNITA, which applied to both the north of Asia and the north of America. This geographical representation could appear justified for this period, since the strait separating America from Asia was not officially discovered until 1728 by the Dane Vitus Bering (1680-1741), whose name it still bears today. However, this strait already appears under the name of the Strait of Anian on the maps of Bolognino Zaltieri, Gerhard Mercator, Abraham Ortelius, Nicolas Desliens, Tramezini, etc., all contemporaries of Sanuto and therefore a century and a half before the official discovery (44).

II.3. The map by Francesco Basso 1571 (Fig. 2)

These parts of the earth are represented somewhat differently on a map drawn by Francesco Basso in Milan in 1571, which is therefore older than that of Sanuto.
It is now located in the University Library of Turin (106 155).

Here too, South America is represented as a dragon's tail. Its identification leaves no doubt, since one can read the names El Peru, El Brasil, Castilla Doro, Bresilia and America Nova, as well as the warning Antbro-popbagi, man-eater, in northern Brazil.

The river network is very sparse. The Amazon flows into the Atlantic far too far south, and the location of its source is even worse at 39° south latitude, i.e. in an area that belongs to northern Patagonia. Its course zigzags across the entire continent from south to north, at right angles to its actual course.

The mouth of the Rio de la Plata is directed northwards and appears to receive only the Rio Uruguay, without any trace of the Paraná, which had already been explored by Sebastian Cabot in 1526-1532.

The south of the continent is cut off from the edge of the map. It is not known what shape the cartographer attributed to Tierra del Fuego, nor whether he had any idea of its existence. However, the vast area of Patali, which seems to grow out of the lower edge of the map, is a legacy from earlier eras of cartography, when Patali was the northernmost part of the Antarctic continent. Or perhaps it is an early cartographic representation of Australia, even if the northern border only extends to 40'S. latitude, instead of 10° S. latitude in real Australia.

The islands of Cuba and Hispaniola are in the right place, while Florida has too much of a twisted outline and is pointing to the southeast instead of

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* The now recognized discovery by the Cossack Semen Deÿnev (Deshnew) in 1648

was still unknown at that time!

South. On the Pacific side, Lower California is too close to Japan and extends north to Asia Magna sive India Bo-realis (Greater Asia or North India). The south coast of the land bridge between the two continents, ie the northernmost point of the Pacific, is at 33° N. latitude, 15° further south than on the Sanuto map.

The land bridge that connects Asia and America north of Japan undoubtedly corresponds to eastern Siberia and Alaska. Francesco Basso calls it India borealis. On many Renaissance maps, the Dragon's Tail is

South America, regarded as the southern extension of China, is called India Meridionalis (South India).

These names and geographical concepts were adopted by the ancient cartographers. They called everything east of Persia India. As early as the 5th century BC, Ctesias wrote a book about India (31). A little later, Herodotus of Halicarnassus (ca. 484—ca. 425 BC) gave a detailed description of the Indians, whose state formed the 20th administrative region in the empire of Darius (89 III 94—105). This included not only the land between the Ganges and Indus, India Cisgangetica, ie the India on this side of the Ganges, but also the area north of the Himalayas, east of Bactria, which was called India superior, Upper India; this term was later extended to the rest of China.

Since Marinus of Tyre, in the first century AD, the information collected on Burma, Siam and Indochina has allowed these regions to be grouped together under the term India transgangetica, India beyond the Ganges. Today we still speak of the Indies beyond. And finally, Marinus and his successors had a little information about a fourth India, which lies beyond a large gulf and extends far to the south. This is what the cartographers of the Renaissance called India meridionalis, South India, but which the Spanish called India occidentalis, West India, a term which is still used today with a geographically restricted meaning, but which at that time covered all of South America.

In 1570, Francesco Basso made a globe on which South America also forms the dragon’s tail (106).

11.4. From Gastaldi (1562) to Girava (1556)

(a) In 1562 the Venetian publisher Giovanni Francesco Camo published a world map signed by Jacopo Gastaldi (Fig. 3), the large dimensions and easily legible inscriptions of which allow a detailed examination (183 286).

In the general impression that this map of America gives, it is similar to that of Francesco Basso. The Amazon rises here at 39° S. Br., i.e. in the north of the Patagonian Peninsula, and meanders to the northwest of

Brazil. The Rio de la Plata is very small; the Paraná, very short, rises at 30° south latitude in what is now the province of Corrientes.

North America is connected by a very wide land bridge that stretches from 40° to 70° N. Br. extends, connected to Asia.

b) The heart-shaped world map (183 285) contained in the Cosmograpbiae Rudimentis published in Basel in 1561 by Johannes Honterius shows a very similar world view to Gastaldi's of 1562, but with strong distortions due to projection (Fig. 4).

c) In 1556 Juan Antonio Castellón and Cristobal Caro published in Mat:land the Dos Libros de Cosmograpbia of the Catalan cartographer Hieronymo Girava from Tarragona (182 46 and 183 281).

The map in heart-shaped projection (Fig. 5) which belongs to this book was made from a model by the German Gaspar Vopelius, as Girava admits, or rather states. It differs from other maps of its time in that on it the source of the Amazon is marked further south than on any other map: at 44° s. Br., in the middle of the province of Chubut.

This map also contains information about the discovery of Tierra del Fuego in

1499, to which I have devoted an investigation (57). d) The world map by Lopo Homem from the year 1554 (Fig. 6). This map, drawn by hand in Lisbon in 1554 by Lopo Homem, is wrongly called a world map. It was commented on in 1948 by Levillier (132) and in 1964 by Bagrow and Skelton (11). The total area of this map is not 360^, but only 250^, which enables the author to avoid the problem of the land bridge between Asia and North America. The note Quarta pars mundi in North America is not an argument against the possible assumption of the existence of this land bridge by Homem, since there is a much larger land connection between Europe and Asia, which are nevertheless considered as two continents.

It is therefore likely that Homem viewed South America as the tail of the dragon, like his contemporaries.

On Homem's map the Amazon flows from west to east, which corresponds to reality, while on the later maps already considered this river flows from south to north. This is only the first example of a phenomenon which we shall encounter more frequently in the course of this investigation: between about 1489 and 1589 the cartographic representation of South America was only distorted.

III. A Single America: The Dragon's Tail (1550—1503)

111.1. Gastaldi's map of 1548

The map by Jacopo Gastaldi, called Carta Marina Nuova Tavola (Fig. 7), is a portulan that shows the entire surface of the earth, with the possible exception of the non-navigable polar regions. It is part of the appendix on modern cartography to Ptolemy's geography, published by Sebastian Münster in Venice in 1548.

This geography of Münster contains the Latin translation by Jacopo d'Angelo, the maps traditionally attributed to Agathodaimon and the modern maps which constitute the "latest status" of the atlas.

Gastaldi's map shows the Florida peninsula, the islands of Cuba and Hispaniola, Mexico under the name of Nueva Hispania; a little further south the name of Mexico; the port of Nombre de Dios with its place name and Venezuela, called Castilla del Oro.

Only the lower reaches of the Amazon are visible, as the cartographer is a cautious man who distrusts the legends surrounding the upper reaches. The Rio de la Plata and the Paraná-Paraguay are correctly drawn up as far as Asunción. Finally, the names El Brasil and El Peru appear in the right places.

These first observations allow us to conclude at a glance that this map, drawn in 1548, is clearly superior to the maps of Sanuto, Francesco Basso and Girava, considered in the previous chapter, which appeared later, because of its greater accuracy and completeness. This is further proof of the strange circumstance in the cartography of South America in the hundred years after 1489: the older a map is, the more accurate it is!

On Gastaldi's Portulan, the American continent ends in the south with a strait called Strecbo de Fernando Magalbaes, in which Italian, Spanish and Portuguese are mixed. South of this strait there is a very large island which includes a very large part of the Antarctic continent and is called Tierra del Fuego. The fact that Tierra del Fuego is part of Antarctica, or rather that Antarctica has been incorporated into Tierra del Fuego, is common to most of the maps drawn between the voyages of Magellan-Elcano (1519-1522) and Le Maire (1615-1617).

On the same portulan, Florida and Nueva Hispania form the eastern part of China, which extends to the south by the dragon's tail. To the west of Florida is Mangi R., ie Mangi Regnum, Chinese Empire.

Further west, still in the Asian-American continent, is Catayo R., the name of China after Marco Polo. Just south of Catayo, the name la Cbine appears for the third time. A fourth China, Serica R.

is found even further west, it probably does not refer to the country in which

where the silk was woven, but the one in which the Arab traders bought it, perhaps Sinkiang or Sogdiana? (95).

The islands of Malucho or Moluccas, Laua or Java and the Malacca Peninsula occupy almost the correct position on the map in relation to China.

The ocean south of Malacca and west of El Peru is called the Oceano Meridional. It is the Mar del Sur, the Pacific of the Spanish.

111.2. From Vopelius 1542 to the Globe of Gotba

a) The globe of Vopelius 1542 (Fig. 8). This globe (183 269), made in Cologne in 1542, contains numerous place names for both Americas. China is not only connected to Canada by mainland, but also further south with what is now the USA and Mexico, because the southernmost part of the land bridge is already at 20? AD, which corresponds to the northernmost latitude reached by the Pacific Ocean.

Tierra del Fuego forms a part of the Antarctic continent, the northernmost region of which, R. Patalis, reaches 25^ s. latitude.

b) The gilded silver globe from Nancy, made in 1535, corresponds to the style of the time (183258). It differs mainly in the metal from which it is made. It is striking that the northernmost point of the Pacific has been moved even further south than in the previous globe: to 16° N.

c) The Atlas Lafreri, published in 1566, contains a world map (Fig. 9) in heart-shaped projection, designed between 1 5 3 4 and 1 5 3 6 by the famous French cartographer Oronce Finé, the Cosmograpbia Universalis ab Orontio olim descripta (183 287 and 62).

The heart-shaped projection distorts the peripheral areas considerably.

ly. Since the meridian of the Canary Islands was chosen as the main meridian, the whole of America is greatly distorted. Its river network is rather poor. The Amazon is here a very short river, the source of which is at 12° S. and which flows northwards. The hydrography of the continent is quite opaque.

The northern boundary of the Pacific Ocean is marked at 22° N, near the Tropic of Cancer.

d) The marble globe of Gotba (Fig. 10) appears to be a reduced copy of the globe of Johannes Schóner from 1 5 3 3. There is a reproduction of the globe in Mollweide projection, designed by Werner Horn, who has devoted several articles to this globe (103).

The shape of the Florida peninsula is very similar to that of Gastaldi. The Gulf of Mexico is less well represented there, and the same can be said of Cuba and Hispaniola. A large estuary is possibly that of the Amazon, although its coordinates suggest the Orinoco.

* The capital of this region is today's Samarkand.

The general shape of the South Atlantic coast is correct, but one looks in vain for the Rio de la Plata. Tierra del Fuego is completely absorbed into the Antarctic continent, which extends far to the north and includes Australia and an imaginary country in the south of the Indian Ocean, caused by fleeting sightings of the Prince Edward Islands, Crozet and New Amsterdam.

Mexico extends to the northwest towards the Asian continent. The Malacca peninsula is larger than India in a west-east direction. The shape and position of the islands east of Malacca do not allow us to distinguish between Indonesia and the Philippines, although these two island groups had already been sighted and explored at the time the Globe of Gotha was created.

III.3. Schöner’s globe of 1533

Johannes Schóner, the famous Nuremberg cartographer, produced the fourth globe known to him in 1533 (Fig. 11). In contrast to his globe constructions in 1515 and 1520, Schóner adopted the idea of the dragon's tail in 1533 and depicted South America as an Asian peninsula.

The coastline, which is very similar to that on the Gotha globe, shows much more detail. The relatively large number of place names on the coast, however, represents only a small improvement. The river network is extremely sparse and suggests that the cartographer did not have the necessary information to draw it correctly. The general representation of South America and Tierra del Fuego shows numerous errors in places that Schoener had drawn correctly on his earlier globes. Here one can again see the decline of cartography in the 16th century.

In the middle of Brazil you can read: AMERICA, INDIAE SUPERIORIS ET

.ASIAE CONTINENTIS PARS, meaning “America, part of Upper India and the Asian continent”.

On Schóner's globe of 1 5 3 3 as well as on the Gotha marble globe, the place names are written in such a way that the lower edge of the letters is directed towards the equator, ie one must turn the globe over if one wants to read the place names in the southern hemisphere.

On this globe, the Pacific Ocean is called Mare Magellani and the Patagonian coast was named after Antonio Pigafetta, the chronicler of the first circumnavigation of the earth.

In both Asia and America, place names are placed on the coast.
The Regio Patalis, very fashionable at the time, extends to 22? s. Br. Further to the west there is a Terra Australis recenter inventa sed nondum plene cognita$, as on the Gotha Globe, in Vopelius and in so many others (63).

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* The Southland, recently discovered but not yet fully known.

111.4. Oronce Fine’s map of 1531 (Fig. 12)

Let us go back further in search of the origins of the dragon's tail. Now it is the turn of a map that has particularly attracted the attention of researchers of our century: the Nova et integra Orbis Descriptio in double heart-shaped projection, made by Oronce Finé 1 5 3 1 in Paris (183 235 and 62).

The fame of Oronce Finés (Orontius Finaeus) derives largely from the doctoral thesis written in Latin in 1890 by one of the best historians of Renaissance cartography, Lucien Gallois (62).

However, this map aroused renewed interest in 1966 when Charles Hapgood published an article in the American magazine Fate (87) in which he came to the following conclusions: The Antarctic continent of Oronce Fine is an extraordinarily good representation of the entire sub-ice coastline of the sixth continent, and its mountains drawn in the interior also correspond to reality. In other words, the coastline according to Fine is that which the Antarctic continent would have if all the ice covering its coastal area were to melt. Hapgood concludes that Fine copied a very old map drawn during an interglacial period when the coast of the Antarctic continent was free of ice. The last of these periods began about 6000 BC and ended in 4000 BC.

Hapgood's cartometric analysis shows that the model used by Fine was drawn in a double heart-shaped projection, which is all the more remarkable since the invention of this projection is generally attributed to Fine himself, since he is the earliest known cartographer to have used it.

It should be noted that Paul Rivet, the founder of l'Homme" in Paris, was convinced that the ,, Museum of natives of Tierra del Fuego had reached the island from Australia via the Antarctic continent during the same interglacial period. Did these later Fuegians know anything about astronomy?

nology and cartography? Even if that were the case, how did their information and maps end up in the hands of Fine, who was working in 16th century France?

These questions, which seem somewhat exaggerated, are much more so when we consider that similar problems faced other cartographers of the Middle Ages and the Renaissance - just as they appear to us today.

Hapgood goes on to explain. The mysterious seafarers must have had solidly built ships. Their knowledge of the art of navigation was outstanding. To produce such an accurate map, they needed triangulation instruments as good as those we have known since the 18th century. The drawing of the map in the shape of a double heart

Projection requires, among other things, the application of spherical trigonometry.

The exploration of a continent, to which Hapgood draws attention, the cartographic recording of its coasts and numerous geographical features of the interior, presupposes the existence of a civilly and militarily highly organized society and a government that was equipped with enormous material resources and a great deal of power and had a great will to expand. All this is incompatible with our current knowledge of human societies in the 6th millennium before our time. The fact that we have no solutions to these prehistoric and early problems does not diminish the fact that they exist.

It should also be added that on this map by Oronce Fine the Asian and American continents have grown together between 20° and 70° N.

The dragon tail is in an intermediate stage between older

older and later maps; e.g. the Amazon flows from south to north, but its source is at 18° S, instead of 39° S as on some later maps.

111.5. The globe of Franz von Mecbeln

The map of Oronce Finé and the other maps and globes discussed in this chapter have one feature in common: the presence of a single South America connected to China by a narrow isthmus easily identified as Central America.

This geographical concept has only a few known predecessors before 1531: a globe design and some map sketches. The design for a

Globus comes from the Flemish monk Frans Smunck, better known under the name Francis of Mechelen or Francis Monachus (183 245).

One of the most outstanding experts on Renaissance cartography, Antoine De Smet, honorary curator of the Bibliotheque Royale Albert Ier in Brussels, has devoted a very interesting article to the Flemish monk (39). According to this, Frans Smunck was born in Mechelen or its surroundings around 1490. After studying at the University of Louvain, he became a Franciscan and spent the rest of his life in his birthplace. Between 1526 and 1530 he designed and prepared a terrestrial globe, which was made by the goldsmith Gaspard van der Heyden, better known as Gaspard a Myrica (37). The globe has been lost, but the commentary that accompanied it has been preserved.

, executed

Francis of Mechelen dedicated this small pamphlet to his patron Jean Carondelet, the Archbishop of Palermo and President of the Privy Council of the Netherlands, which had its seat in Mechelen. Charles, the Crown Prince of the Netherlands

lande, was at the same time King Charles I of Castile and the German Emperor Charles V,

He was therefore able to devote little time to his native country and trusted the

Government business to his relatives with the support of the secret

Rates.

The title of the small publication is: De Orbis Situ ac Descriptione, ad Reverendissimum Dominum Arcbiepiscopum Panormitanum Francisci Monacbi ordinis Franciscani epistola sane quam luculenta. Three editions are known. The text includes the complete description of the globe as well as the theories underlying its construction. The first edition also contains the oldest known representation of the earth in two hemispheres (Fig. 13), if one excludes the one by Macrobius mentioned above, which did not show the known world, but the imaginary world. The two representations of hemispheres in the booklet by Francis of Mechelen do not claim to be maps, but are sketches drawn to facilitate the understanding of the explanations about the production of the globe.

The Western Hemisphere shows South America in the shape of a dragon's tail, with the only difference being that the Central American land bridge is cut through by a narrow canal, a kind of precursor to the Panama Canal. This canal reflects the idea shared by Christopher Columbus, Rodrigo de Bastidas, Alonso de Ojeda and others of a western passage along the Antilles.

The globe of Francis of Mechelen served as a model for Oronce Finé and Gemma Frisius. These globes have the following features:

1. The inscriptions in the Southern Hemisphere are upside down when the North Pole is at the top.

2. South America forms the tail of the Chinese dragon.

3. For the first time a large southern land appears on these globes, separated from the Dragon's Tail by a strait, a precursor to the Drake Passage rather than the Strait of Magellan.

The depiction by Francis of Mechelen is thus the oldest known map on which

the Antarctic continent is not connected to South America.

Three globes are known whose inscriptions are inverted in the southern hemisphere: the marble globe of Gotha, that of Schóner in 1533 and that of Francis of Mechelen (103). The same feature can be found on the world map of Nicolas Desliens from 1566 (183 288).

Furthermore, Francis of Mechelen's text contains a reference to the city of Catigara on the Pacific coast of South America, which will be discussed in a separate chapter in this book.

The gilded globe, which is in the Bibliotheque Nationale in Paris, dates from the same period as the design by Francis of Mechelen and is generally dated to 1 5 26. Its unknown author also depicted South America as a dragon's tail.

III 6. The sketches of Alessandro Zorzi, around 1503

On all maps examined so far, South America was connected to the Asian continent by a relatively long and narrow isthmus, which corresponds to Central America.

Later I will discuss a number of maps on which this Central American isthmus is not present. The Dragon's Tail is

directly attached to the south of Asia, with the whole width of northern South America and without any isthmus. Before considering this family of maps, let us look at a group of sketches which, by their characteristics, belong to the older group and which have been the subject of extensive debate. These are the drawings generally called "Bartholomew Columbus' maps".

During his fourth voyage, Christopher Columbus explored the South American coast from Colombia to Panama in search of a strait that would allow him to continue westward to the Asian Indies, which Vasco da Gama had reached in 1498 at the head of an official Portuguese fleet.

Through the natives of Veragua, Columbus learned of the existence of a great ocean, nine days' march far to the west.

From that moment on, the cartographic concept of the connection between Asia and the Dragon's Tail changed. The older maps, which Columbus also had at his disposal, showed the two continents united over the entire width of the northern side of the Dragon's Tail, about 40°, as the following chapters will show. By uncovering Veragua, Columbus learned that this distance was reduced to nine days' walk (about 3°). Later, after the discovery of the narrowest point of the Isthmus of Panama, the connection between the two continents shrank to just 1°. The Dragon's Tail thus became an almost independent continental mass (158 and 159).

George Nunn showed that the three sketches long attributed to Bartholomew Columbus, the admiral's brother, were the first cartographic representations of this changed conception (160).

These sketches are in a collection of travel reports under the general title Alberico, i.e. Amerigo Vespucci, kept in the National Library in Florence. The collection, which consists of four parts, was compiled by the Venetian Alessandro Zorzi. Numerous sketches and plan drawings adorn the margin of the text. The ones of interest here are not in the margin, however, but at the bottom of the pages, such as the back of page 56, the front of page 57 and the back of page 60 of Codex 81 (Fig. 14 and 15), which contains the Italian version of the letter from Christopher Columbus dated 7 July 1503 under the title How Columbus discovered and sailed for the equinoctial coast of the Indies to the Arctic Ocean and arrived in the Catalan region (161).

These sketches were first published in 1893 by the Austrian historian Franz von Wieser, who attributed them to Bartholomew Columbus (211). The Swede Adolf Erik Freiherr von Nordenskióld reproduced them in his book on the history of cartography, Periplus (757), without casting doubt on Wieser's attribution to the admiral's brother.

The following generation subjected the work of the previous century to harsh criticism, and Wieser's theory was attacked, at least on this point, by John Bigelow and Roberto Almagià.

Bigelow writes that the now lost map of Veragua, which Christopher Columbus is considered to have drawn, was not used as a model for these sketches (17). According to Bigelow, Columbus was looking for nothing but gold and precious stones, especially pearls, during his fourth voyage, and not for a sea route to the Pacific.

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7 .ÿ At the beginning of the 1520s, Zorzi collected maps and diaries of voyages of discovery.

Mediterranean Ocean, which Columbus rightly identified with the Great Gulf, which on his maps bore the Latin name Sinus Magnus, the translation of Megas Kolpos of Ptolemy and Marinos of Tyre.

Bigelow claims that Wieser made three mistakes: 1) he confused the sketches of Florence with the map of Bartholomew Columbus; 2) he confused Bartholomew's remarks with the Descrip-tio Jeronima, the text allegedly entrusted by Bartholomew to his confessor, Brother Hieronymus of the Basilica of St. John Lateran; 3) he confused the Descriptio Jeronima with the memorandum of Zorzi, which is the document kept in the National Library in Florence. Bigelow adds that these sketches are not marginal notes to the text of the "Letter of Christopher Columbus", but rather illustrations of the text by Alessandro Zorzi.

Almagià also rejects the attribution of these sketches to Bartholomew Columbus (2) and points to the sketches made by Zorzi in a codex in Ferrara. These sketches are, according to Almagià, a first version of those in Florence. From this he concludes that the drawings are by Zorzi himself and not by Columbus and that they correspond more to Zorzi's cartographic conception than to that of Columbus.

The maps which formed the basis for Christopher Columbus's ideas in preparation for his first voyage belong to the Hammer-Behaim-Laon group. These three cartographic documents are well known and a separate chapter of this book is devoted to the first two. The Laon globe was probably influenced by Behaim, as Behaim was by Hammer. It is possible that Hammer took some of his ideas from Toscanelli, but since the latter's map is lost, it is difficult to come to any firm conclusions on this point.

46

According to George Nunn (16119), the depiction of the north coast in the Caribbean Sea on sketches 5 does not correspond to the ideas of the Columbus brothers. When he examined the drawings in more detail in Florence, Nunn found that the section between Retrete and the Cabo de Luna of the sketch on the back of sheet 60 was by Columbus, but the rest was by Zorzi, and did not correspond to Columbus' ideas.

Zorzi, for his part, claims to have received the notes from Brother Hieronimus in Venice, who in turn received them from Bartholomew Columbus in Rome. However, he says nothing about the cartographic sketches.

47

IV. Contest between two South Americas (1534—1502)

Between 1534 and 1502, two families of maps existed simultaneously, reflecting incompatible ideas. One, discussed in the previous chapter, places all the geographical information about America collected by the Spanish and Portuguese conquistadors in the dragon's tail. The second, to which this chapter is devoted, shows two South Americas: one in the "Far East" and one in the "Far West".

Far Eastern South America is both the origin of the dragon's tail on the maps already discussed, which were drawn between 1574 and 1502, and the result of the earlier maps, the trail of which this book follows in the hope of determining exactly the origin of the idea of South America as the dragon's tail.

The "far-western" South America is located in the west of the Atlantic Ocean, opposite the coasts of Europe and Africa. And it is here, in this western America, that the maps of this second group placed the information received from the official Castilian and Portuguese fleets since 1492. The medieval ideas about the islands of the western Atlantic changed thanks to the new expeditions to this sea area. For example, the island of Antilla on the maps from the beginning of the 15th century became the archipelago of the Antilles discovered by Columbus and his successors (28). |

The most recent cartographic document on which the two South Americas are to be found is the very beautiful world map by an unknown author, entitled Typus Cosmograpbicus Universalis, which comes from the Epitome trium terrae partium Asiae, Africae et Europae by Joachim Vadiano, printed in Tiguri in 1534 (182 135). Apart from a few details of the Indian Ocean which are of no importance for this study, it is a copy of a world map by Sebastian Münster, bearing the same title, which is contained in numerous copies of the Atlas Novus Orbis Regionum ac Insularum Veteribus Incognitarum, published simultaneously in Paris and Basel in 1532 by Simon Grynaeus (Fig. 16).

On this map, the new, western America has a shape that in no way resembles reality. Inside, place names, rivers and mountains are completely missing: there is total emptiness. Only three names can be read: America, Terra Nova and Bresilia (183, 254 and 256).

The 'old' South America occupies the normal position of the dragon's tail, forming the southern extension of China in the Far East. Its general shape is quite close to reality, at least it is much more accurate than that of the 'new' America. Its coastline correctly represents many details and shows only a few distortions, which probably go beyond the numerous

Intermediary by the outstanding German cartographer Heinrich Hammer from Florence.

This Eastern America is the real tail of the Chinese dragon, for it has grown into China. The unfortunate thing about the maps with the two Americas is that all the new information has benefited Western America, a poor suggestion, full of errors at that.

The important cartographer Peter Apian(us) (actually Bennewitz or Bienewitz) shared the ideas of his time. In a simple heart-shaped map (Fig. 17) which he drew in Ingolstadt in 1530 (183 252), the dragon's tail is better represented than on other world maps which will be discussed here, because Apian deviated less from the model, Hammer's Ptolemy map, which was mainly conveyed by Waldseemüller's world map of 1507. Western America is better represented than on certain later world maps; however, this is of less interest for this study, which is limited to the dragon's tail.

The same can be said of the map by the same author, published in Antwerp in 1530 under the title Typus Orbis Universalis iuxta Ptolemei Cosmograpbi traditionem et Americi Vespucii Alior-umque lustraciones a Petro Apiano Leysnico elucubr(atus) (183 251) (Fig. 18). It is clearer than the previous one, because its projection does not distort the areas further away from the central meridian so much.

A portulan drawn by Pietro Coppo in Venice in 1528 (Fig. 19) attracts attention only by the unusual shape of its new America, which reminds one of a stuffed tomato, while the dragon's tail has, on the whole, the correct shape of South America (10 and 183 249).

The same opinion applies to the painting by Benedikt von der Leyen, also made in Venice in 1528.

detto Bordone's world map (Fig. 20), on which the dragon's tail is a poor imitation of the original, while the new America corresponds in no way to reality. How do we know that this grotesque shape is supposed to represent South America? Only from its geographical position west of Africa and the designation that can be read there: mondo nuovo (183 247).

There are a whole series of world maps that can be derived from Waldseemüller's map from 1507. The dragon's tail always has the same shape. The new America in the west, on the other hand, is just a shapeless mass, the contours of which vary greatly from one map to the next and which hardly has any place names.

men. This is the case, for example, with the new world map that Laurentius Frisius included in his edition of Ptolemy's Geography, published in Strasbourg in 1522, which he entitled somewhat pompously Orbis Typus Universalis iuxta Hydrograpborum Traditionem exactissime depicta (183 235) (Fig. 21).

The Orbis Universalis type, published in Vienna in 1520 by Peter Apian, has a pseudo-heart-shaped projection. It shows the dragon's tail like all maps in this group.

Johannes Schóner also retains the dragon's tail on his globe of 1520 (183 234). It is noteworthy, however, that his new America has a better general shape and coastline in the west than those on the maps of Laurentius Frisius of 1522 and 1525, Bordone 1528, and Pietro Coppo of the same year, etc. Here we see again that the development of cartography was in decline between 1489 and about 1570.

Johannes Schöner's globe of 1515 contains some important differences in the new America compared to the globe of 1520. But the dragon's tail has remained the same on both globes (210 and 183 215).

The world maps of the Margarita Philosophica and the globe of Louis Boulengier of 1 5 1 4 (183 221 and 222) draw from the same source as the previously mentioned maps, but are inferior to them in accuracy and features.

Of the very famous map of Piri Re'is from 1513, we only have the western part, on which the new America is shown with numerous details that cannot be explained by the known expeditions carried out before the date of production (86, 183, 216, etc.). Since the Piri Re'is map belongs to both the European and the Arab-Islamic map tradition, it is not possible for us to reconstruct the appearance of the Far East on it. However, it seems that both the medieval

From both the Arabic and the European tradition it is very probable that Piri Re'is had drawn the dragon's tail in the east. To what extent it was depicted correctly cannot, of course, be said.

The maps of Stobnicza 1 5 1 2 and Bernardus Sylvanus of 1 5 1 1 are simple copies of the map of Waldseemüller, apart from the projection of the latter's map. The representations of Henricus Glareanus of 1 5 1 0 are more accurate. The globe of Lenox corresponds to the same conception (183 209).

The Universalior Cogniti Orbis Tabula ex recentibus confecta Observationibus (183 80-82 and 207) of the Dutch monk Jan Ruysch (Fig. 22) was published in Rome in 150 8 as an updated appendix to Ptolemy's Geography to explain the booklet Nova Orbis Descriptio by Marco Beneventano.

The great peculiarity of this map is its fan-shaped projection with a polar angle of 222°. This representation was made by Contarini — Rosselli in 1506 (183 198), but despite its great advantages it was not adopted by later cartographers.

On this map by Jan Ruysch, an inscription south of the new Americas is of great importance for the early history of discovery: Nautae lusitani partem banc terrae bujus observarunt et usque ad elevationem poli antarctici 50 graduum pervenerunt nondum tamen ad ejus finem austrinum. In English: "The Portuguese sailors have sighted this part of the area and are as far as 50° s.

Br. without reaching its southern end." This is obviously an allusion to the voyage of the Portuguese fleet of Gonzalo Coelho, temporarily under the command of Amerigo Vespucci, in 1501 and 1502.

For the rest of the map, Ruysch used Waldseemüller's world map as a model, which was printed in 1507 but whose blocks were cut in 1506. He retained some of its errors, but improved certain important points: he replaced the old name Taprobana with the name Seylam (Ceylon), which Waldseemüller and others had given to a fictitious island near Tierra del Fuego, and he gave the name Taprobana to the island of Sumatra opposite Chryse Chersonnesus (54). These concepts will be explained in more detail in the following chapters.

The map by Contarini and Rosselli from 1506, as already mentioned, introduces the fan-shaped projection (Fig. 23), which Ruysch had adopted. His map is better than Contarini's in terms of the place names of the new America, although it is only two years younger. On the other hand, the shape of the old South America, the dragon's tail, is more precise in Contarini than in Ruysch (183 198). I now come to the three maps signed by Rosselli, who had worked as an engraver in Florence since about 1480 before devoting himself exclusively to cartography. His three maps are undated and differ in their representation and purpose. On the other hand, their cartographic content is very similar. They are two oval world maps and a nautical chart.

The three maps must have been drawn before 1 5 0 6, although they were not published until much later. They were probably not known to Waldseemüller when he designed his map, which was published in 1507.

One of Rosselli's oval world maps measures 35 - 19 cm. It is a very Beautifully colored map. Although it was printed, only one copy is known, which was discovered at the beginning of the 20th century (183 70 and 199).

The sea chart, which is also colored, measures 29 - 14 cm and belongs to the same atlas as the world map described. The geographical content of both maps is almost identical, although the sea chart is drawn in portulan (183 70 and 201).

The other oval world map measures 172 ° 325 mm. It is stored in the National Library in Florence, where it is contained in an edition of Bartolomeo dalli Sonetti's "Isolario" (Island Book) published in 1532. The year is, however, doubtful; Almagià suspects that 1510 or 1516 would be more correct.

On these three maps, the old America forms the dragon's tail, similar to that of Waldseemüller, but with less oriental influence; this limitation of error is no doubt due to the lack of space, due to the small size of this map compared with Waldseemüller's. The new America is located in the extreme west. It is a large tomato-shaped island, which bears the name Terrae Sanctae Crucis sive Mundus Novus (193).

Finally, the King-Hamy nautical chart (purchased by Richard King and examined by Ernest Théodore Hamy) is worthy of mention. Alberto Magnaghi attributed it to Amerigo Vespucci, but the Portuguese influence in it cannot be ignored. If this map was drawn in 1 502, as is assumed, it is the oldest document showing the two South Americas (183 64 and 191, 182 57-59).

V. Three South Americas on one map: Waldseemüller 1506—1507

V.1. The dating of Waldseemüller's map

The famous world map that Waldseemüller published in 1507 (Fig. 24) is the oldest printed map on which South America is shown twice. To be more precise, three times:

— South America No. 1 is the Dragon's Tail in the Far East.

— South America No. 2 is a large island extending in the extreme west between the Central American Strait at 10^ N. latitude and the lower edge of the map at 42^ S. latitude.

— No. 3, which bears the name PARIAS, lies between this inter-American strait and 28° N.; it is the southern part of a large island in the extreme west, which extends to 53? N. As Professor Demetrio Ramos of the University of Valladolid has shown, this island represents the whole of America, that is, North and South America. At 30? N. one can clearly distinguish the Florida peninsula and the Gulf of Mexico, to which South America adjoins to the south, which, although considerably reduced in size, is correctly represented in its general shape. Three rivers which flow into it near the Tropic of Cancer are probably the Orinoco, Amazon and Tocantins. According to Waldseemüller, they have a common source. This whole of America is in the northern hemisphere.

Other cartographers have adopted this feature of Waldseemüller's map, so that they have also drawn three South Americas: among others, these are the globes of Johannes Schóner from 1515 and 1520 and the map Typus Cosmograpbicus Universalis by Sebastian Münster, 1532.

Waldseemüller's world map of 1506—1507 became famous because it is the oldest printed document on which the New World bears the name America.

It consists of twelve individual sheets, which together form a wall map of 136 °

248 cm, entitled Universalis Cosmograpbia secundum Ptolomaei traditionem et Americi Vespucii aliorumque lustrationes. It was accompanied by a short treatise by Mathias Ringmann, Cosmograpbiae Introductio, which sets out the general principles that guided the cartographers of Saint-Dié in Lorraine in preparing this map (40 152ff.).

Several surviving letters from Waldseemüller prove that this undated map was printed in 1507, but also that the printing was delayed by the slowness of the necessary steps. This means that the map was ready for printing before 1507, and in this case "ready for printing" means that the wooden blocks had been cut. Can the time of cutting be determined?

A detailed study of India cisgangetica, that is, India on this side of the Ganges in comparison to the African coast (Fig. 25), makes it possible to set this date to the period between January and May 1506.

The cartographer has marked a padreo, a stone column crowned with a cross decorated with the coat of arms of Portugal, at every town on the East African coast, from the Cape of Good Hope to Malindi. The Portuguese sailors had the order and the habit of erecting such columns as a symbol of their claim to sovereignty in all conquered territories.

Now Waldseemüller has not marked a padreo anywhere on the Malabar Coast or anywhere else in India.

Vasco da Gama's voyage (1498-99) was purely a commercial exploration of the highly developed ports held by Indians and Arabs. It could therefore not serve as a pretext for announcing a Portuguese claim to these places. The conquest was only carried out in 1505 by the Viceroy Francisco de Almeida, who left Lisbon on March 25 of the same year with a powerful fleet. On the east coast of Africa he conquered all the Arab forts as far as Malindi in what is now Kenya. From there he went directly to the Malabar Coast, which he conquered completely between September and December of the same year, 1505.

The first returning fleet arrived in Lisbon on May 23, 1506.

brought with him a large cargo of spices and the news of the conquest, especially of the towns of Cananore, Couleo and Cochim. If Waldseemüller's map had been cut after May 1506, it would necessarily have had to show padröes in the towns of the Malabar Coast.

On the other hand, the African ports where Waldseemüller has marked these padröes had been conquered by the same Almeida fleet in 1505. It must therefore be assumed that one or more ships returned to Portugal after the conquest of Malindi but before the capture of Malabar. Ideally, these ships could have arrived in January 1506.

Cutting the printing blocks for this map by Waldseemüller must be must have taken place after this date and must have taken place between January and May 1506.

V.2. Tierra del Fuego

Waldseemüller's map (Fig. 26) shows in the extreme east the same peninsula that I have identified in the previous illustrations. It is the dragon's tail, i.e. South America.

An advantage of Waldseemüller's map over the later maps already mentioned is that Tierra del Fuego is shown in its correct dimensions, in any case more accurately than on maps that show it as part of the Antarctic continent (Fig. 27).

Waldseemüller's Tierra del Fuego was the subject of a heated controversy among Argentine historians of early maps. The first to tackle this issue was Professor Enrique de Gandia, who identified Tierra del Fuego with the large triangular island lying immediately southeast of the Dragon's Tail (68). The shape and size of this island support this interpretation. However, Waldseemüller gives this island the name Seylam, another spelling of Ceylon.

Gandia naturally identifies the sea arm that separates this island from the mainland with the Strait of Magellan (66), which was explored in great detail between 1490 and 1520 as a south-west passage leading from Europe westwards to India and China and later to the Moluccas. The length of this sea arm on the map corresponds very well to that of the Strait of Magellan.

But its straight course and its north-south orientation do not correspond to reality, because the strait actually has the shape of a V open to the north and its two mouths are at the same geographical latitude.

But can one expect such precision from a European cartographer who mapped the Strait of Magellan 13 years before its official discovery?

The practice of early cartography had accustomed me to demand a great deal from the cartographers of the Renaissance. I could not be satisfied with the explanation offered and sought another.

I have studied the southern end of the Dragon's Tail in detail, where the continent ends in a triangular peninsula, united only by a narrow land bridge flanked by two bays. The eastern bay is much larger and more rounded than the western one.

Such an isthmus does not exist in South America. Now the shape of the peninsula, one might think that it could be Tierra del Fuego. This in turn would suggest that the Strait of Magellan had not yet been recognized as a strait, but the two entrances, which appeared to be bays, were known.

This view is confirmed, or at least strongly supported, by the report of Pigafetta, the chronicler of Magellan, who states that when the fleet arrived at the mouth of the strait, all the helmsmen were convinced that the bay, between Punta Dungeness and Primera Angostura (First Strait), in which they were located, was surrounded by mountains and had no exit to the west (165). It could therefore not be the passage to the Pacific that was so sought. It is therefore quite natural to assume that the mysterious researchers who provided the necessary information to Waldseemüller's predecessors and models

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* In contrast to the Northwest Passage (north of North America) and the Northeast Passage (north of Europe and Asia).

tions, passed the eastern entrance without seeing anything other than a large round bay.

Due to its triangular shape and dimensions, the Dragon's Tail Peninsula lends itself to identification with Tierra del Fuego just as well as the island of Seylam, which is admittedly also triangular and has the same dimensions.

On the other hand, this interpretation raises a new problem: if this peninsula represents Tierra del Fuego, what is the island of Seylam? Is it the island of States? It could be because of its location, but certainly not because of its shape and size. The question was badly posed, which hinders the solution.

The island of Seylam is one of a group of eight large islands that are marked southeast of the dragon's tail by Waldseemüller and his models. They are called: Candin, Java Maior, Necura, Angana, Peutam, Java Minor and Seylam. Their names already indicate that they are islands from the Indian Ocean that, due to an error in the geographical concept, have been moved to a place that, due to their position in relation to the dragon's tail, is the southeast of the Atlantic.

Waldseemüller took this error from Behaim, who in turn took it from Hammer's map, which is now in Yale.

The relocation of these islands includes those of Ceylon. Waldseemüller's Seylam is therefore not Tierra del Fuego, but an intruder that has no business being here. The real Tierra del Fuego is therefore the peninsula

at the end of the dragon's tail. This confirms that the Patagonian Strait, today called the Strait of Magellan, is replaced on this map by the Patagonian Isthmus, which unites Tierra del Fuego with the Dragon's Tail.

V.3. The Land of Coyle

With the aim of finding new elements that either support or weaken these theses, I have examined the place names and inscriptions of this peninsula at the end of the Dragon's Tail.

There are only two place names in the true sense of the word, but each of them is accompanied by a short commentary. A comparison with Waldseemüller's models shows that only the place names are borrowed from them, while the comments appear to be the cartographer from Saint Dié's own, mostly erroneous interpretations, who transferred information about the Far East and Asiatic India to Tierra del Fuego.

In the eastern part of Tierra del Fuego, on the Atlantic coast, the name Coilum Civitas is found. Waldseemüller's most important model shows a very similar designation Regnum Coylum or Land Coyle, which is more accurate. The name

today marks a rift in southern Patagonia, north of the Strait of Magellan, and the same word Coyle is contained in several place names in the area.

It is obvious that the Coyle of these maps is the Coyle of present-day Patagonia. It is located on the mainland, as is actually the case, since the map shows a Patagonian lands rather than a Patagonian strait. One could only accuse Waldseemiller, or rather his model, of having moved Coyle too far south. For the cartographers working in Europe, this shift occurred 15 or 30 years before Magellan's voyage and almost three centuries before the discovery of the mouth of the Coyle by the Malaspina expedition.

Felipe Bauzá, the cartographer of this expedition, gave the river the name Coy, which has sparked controversy among Argentine historians.

Paul Groussac has devoted a long study to this place name and has come to the conclusion that Coig is the correct spelling. This was the name of a Spanish naval officer who took part in the supplementary expedition sent to the Patagonian coast two years after the one led by Malaspina to complete the cartographic work (80). The report of the supplementary expedition actually mentions the participation of the officer Claude Coig y Sansón, but does not give his name to the river (1 39).

Leoncio Déodat claims that the name actually sounds like Coy, which is the local word for “lake” (36).

The English Beagle Expedition under Captain Fitz Roy? called the mouth of the river Coy — Inlet, a name which is undoubtedly based on the Spanish map mentioned above.

Milanesio and Vuletín dispute the spelling Coyle and assume an Araucanian origin, which is rejected by Déodat (175), with the good reason that the Araucanians!® never advanced so far south.

ren.

Groussac also rejects the name Coyle, which he considers to have its origin in the English Coy Inlet. But Déodat, for his part, rejects Groussac's Coig and defends his "native" Coy, without specifying to which dialect it belongs.

This discussion of geography, history and place-name studies, conducted at a high intellectual level, loses all meaning when one considers that the place name Coyle, or in Latin Coylum, can already be found on Waldseemüller's map of 1506-07 and on his original, the map by Hammer from 1489.

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* Expedition made famous by the participation of Charles Darwin (1833—1835).

' Warlike Indian tribe in Chile and western Argentina until the 19th century.

V.4. The Land of the Alakaluf

The northwest of the triangular peninsula that I have identified as Tierra del Fuego is marked by a single place name: Lac Regnum, that is, land of the Lac. Who are these Lac?

The entire western part of the Feuerlindian archipelago has been inhabited by the Alakaluf since time immemorial, so that no native legend tells of the arrival of their ancestors at the Feuerlindian channels, nor of them having to conquer any peoples in order to gain control of the area.

I have asked several experts about the origin of the word Alakaluf. There is a certain consensus that this word comes from the call Alak - wulup with which the natives greeted the first European travelers in the 18th century. The previous contacts were limited to tragic encounters, such as that with the Dutch of Van Noort in 1599 (111). This word, repeated several times, has stuck with them as a folk name, as has sometimes happened in the course of history.

I did not find this explanation satisfactory and continued my search. I was lucky enough to find the answer in the Italian-Alakaluf dictionary by Father Maggiorino Borgatello (19), the result of his long conversations with Alakalufs seeking refuge in the mission on Dawson Island in the Strait of Magellan.

It states on pages 539—540:

Indian Tehuelci!! Ciettistar
India Onas!! Shelkenam
Indi Alacaluffi!! Hairo

Indi qualunque Aloculup and on
page 548:

Civilized man with a lepaicot
Indian Man Aloculup

A comparison of the two series clearly shows that the word Aloculup includes all natives, both those from the mainland (the Tewelche or Tehuelche), as well as those from the large island of Tierra del Fuego (the Onas) and the peoples of the Tierra del Fuego caniles living on and near the water (the Alakaluf), but not the "civilized people", the whites.

In other words, Aloculup means inhabitant of the country, native or even simply human, because it is clear that the European is not a normal human being and cannot be described with the same word as the people of this region.

This also makes it possible to understand that the word Aloculup of the Alakaluf group from Dawson Island corresponds to the word Alak-wulup, from which their present name comes from. From this one can also deduce that this word in one form or another is the native word in their own language.

In this word the second and fourth syllables are stressed: lak and lup.
One of these two syllables had to survive when the word was worn out by tradition and retransmission through numerous unknown intermediaries until it reached the cartographers of the Renaissance via mysterious routes. Lac is the syllable that has survived because it has three advantages: it comes before lup, the well-known priority of a over u and the stronger emphasis.

!! Tribal names.

It could be objected that Alakaluf is only one of the words used to designate this tribe, which was also called Ezoos, Keyubunes and Pecberai, while they spoke of themselves as the Hairo or Qawashgar (23).

This argument is of little importance, for in the same way those who call themselves Germans are called Tedescbi, Njemec or Germans by other peoples, which does not in the least diminish the value of the words Allemands, Alemanes or Alemaos by which they are designated in French, Spanish and Portuguese.

Furthermore, the names Enoos and Pecberai were given by travellers to the natives of the inner and eastern parts of the Strait of Magellan, while Alakaluf refers to the natives of the western part of the archipelago, exactly where the words Lac Regnum can be read on Waldseemüller's map of 1507.

V.5. Waldseemüller's comments

Under the words Lac Regnum there is a commentary which proves that Waldseemüller made a mistake when he added information to Hammer's map which was intended to be supplementary but is nothing other than erroneous.

According to the general shape of his world map, the author believes that the Dragon's Tail is part of the countries of the Far East, which were of interest to the Portuguese and about which some information had already been obtained through the Italian traveller Nicolo de Conti (24).

The inscription under the words Lac Regnum is partly unclear and partly edited. However, I was able to decipher most of the words and have come up with a text that, I hope, contains only a few errors:

Here comes the blessed memory (?) of those who have given up / who have given up good and just / who have given up completely / for fear of losing their beloved / rant.

With due reservations, I propose the following translation:

Here live the Brammans (?), who abhor lying unusually strongly; they live very chastely and are good and righteous, but they are idolaters; they walk about completely naked; they worship tubs.

This reference is taken almost word for word from Marco Polo's travelogue, in chapter 178: Of the Province of Lar: "De cest Provence sunt nes tuit les abraiman . . ils ne diroient nulle mensonge . · · . They are not luxurious for that with their women. They tolerated no reason at all" (168). “From this province come men all Brahmins . · . they would never tell a lie . to their wives. · . They only sleep with They steal nothing from anyone." From this it is clear that Waldseemüller has provided information about Tierra del Fuego with information concerning Asian India.

In the middle of Tierra del Fuego, Waldseemüller puts the note:

Silva lign / Setbim, a mixture of Latin and Hebrew, which according to dictionaries can be translated as sandalwood or Brasil(bolzywald and also conveys information of Indian origin.

Under the words Coilum Civitas another text confirms the error of the Cartographers:

Here, Christians and Jews, baptized in their own language, are none other than the tributary of all species.

This can be translated without difficulty:

Christians, Jews and idolaters live here; they have their own language, their king is not obliged to pay tribute to anyone; they possess all kinds of spices.

These are details taken from Marco Polo's chapter 181, which concern the kingdom of Coilum. Once again, Waldseemiiller confuses Tierra del Fuego with areas of Southeast Asia, perhaps with Malacca, where the Portuguese had sent a trading expedition in 1509, only to return as conquerors in 1511.

A final text example confirms the error of the cartographer from Saint Diÿ. Next to Tierra del Fuego, the text of a large cartouche begins with the words:

In this region our body is full of warmth and insatiable heat.

Life in these regions is difficult because of the intense heat.

As the geographical latitude of his map proves, Waldseemüller believed that Tierra del Fuego was located under the Tropic of Capricorn, and his explanations reflect the errors in his assumptions.

This is certainly excusable, since Tierra del Fuego was not reached until seven years later by a known fleet, the fleet of Haro, and only received its name thirteen years later (53).

VI. Martin Behaim's potato from 2

VI.1. Lack of agreement between the globe reproductions

We now enter the period immediately before the first voyage of Christopher Columbus and thus also the era before the first discovery of America by the fleet of Castile and Aragon. The maps of this period are therefore an expression of the geographical ideas at the time when Columbus was preparing for his first voyage (158).

Martin Behaim's Erdapfel, which is now in the Germanisches Nationalmuseum in Nuremberg, was created during Christopher Columbus's first voyage, without knowing its results. It is certainly not the oldest terrestrial globe ever built, since it is known that Crates of Mallus gave a globe to King Attalus XI of Pergamon around 150 BC (197 II C 116). Globes continued to be built, even in the Middle Ages, when many geographers believed that the earth was flat, and Bagrow assures us that Cardinal Nicholas of Cusa (Nicolaus Cusanus), who died in 1464, owned "several terrestrial globes" (11 190), all of which have unfortunately been lost.

From this one could conclude that the Nuremberg Earth Apple is the oldest globe that has survived to the present day. This is only partly true.

In fact, it is necessary to distinguish between the inner part, which has no geographical interest, and an outer part, which bears the drawing of the continents, mountains and rivers, with the places, their names and numerous explanatory notes that are of great importance for the history of geographical science.

The inner part of the Nuremberg globe is actually the one that Martin Be-baim presented to the city council in 1492. If we believe Oswald Muris, who has devoted an excellent study to this globe (148), the interior of the globe was glued to hemispherical forms by Kalperger and Glockendon with papier-mâché and covered with a layer of plaster. Other experts believe that the interior of the globe is made of wood (41 234). The parchment segments, painted, inscribed and colored under the supervision of Martin Behaim, were glued to the plaster.

The outer part of the globe, its coastlines, mountains and miniatures, and above all the texts which cover almost the entire surface of the globe, have been "improved" and updated several times over the centuries by people with the best intentions but unfortunately not as expertly as one would have wished, so that many details of the globe are lost.

The dragon's tail on the Nuremberg potato is, at least in the outline of the continent, strongly reminiscent of Waldseemüller's map, which, incidentally, is influenced by Be-haim and his model Hammer.

The interior of the Dragon's Tail, its network of waters and its numerous inscriptions have, as already said, been frequently altered. Fortunately, its successive states are preserved in various reproductions of the globe in the form of world maps, globes or segments, made by geographers of past centuries (207).

Such reproductions exist by Doppelmayr (Fig. 28) 1730 (43), Murr 1778 (149), Lelewel 1849 (131 Atlas, Plate XXXI), Ghillany 1853 (74), Jomard 1862 (112), Nordenskióld 1889 (156), Guillemard 1890 (82), Ravenstein 1908 (171), Carlos Sanz (182 and 183), as well as in the Encyclopaedia Britannica (48)

(Fig. 29) and a reproduction in segments in the possession of the Geographical Service of the Spanish Army (Fig. 31), as well as a wonderful compilation of 92 photographs published in the magazine Ibero - American Archives (Berlin) (Fig. 30), covering the entire globe in its present state (107).

Of all the reproductions, the series of 92 photographs is undoubtedly the most reliable. From them one can see that the whole sphere is covered with inscriptions, some old and blurred, others new and legible, with all the gradations in between. It is not always easy to determine whether the disappearance of certain inscriptions is due to age, whether they have been obliterated by use, or whether they were deliberately made. Some of these inscriptions, but not all, have been replaced by a text which may be a faithful repetition of the missing text, but sometimes by a "correction" or a summary of it.

Sorting the inscriptions according to their age would be a task that would take several years for a specialist in German calligraphy (the art of writing) of the Renaissance.

According to Muris, the original colours have disappeared (148). Ghillany speaks of a restoration carried out in 1823 by a Mr. Karl Bauer and his son. Ravenstein mentions another restoration in 1847 and emphasizes the inadequacy of the restorer and author of numerous erroneous inscriptions.

After its acquisition by the German government in 1937, the globe was restored "on the basis of the oldest copies and facsimiles." This task must have been very difficult, because the reproductions I have mentioned do not resemble each other or the real thing.

From the 16th to the 20th century, every "corrector" or "restorer" on the globe has realized his personal ideas about the hydrography of the Dragon's Tail - without knowing that it is South America!

Numerous errors were added to Behaim's globe, which in turn was not very faithful to its excellent model, the Ptolemy map of Hammer, which is dealt with in the next chapter.

The analytical and comparative study of the dragon's tail on the various reproductions of this globe would easily fill an entire book, so I will restrict myself to the southern tip of South America: Tierra del Fuego, which is also shown here as a peninsula.

A first examination already reveals that some reproductions are copies of others, which allows about half of these documents to be excluded from further investigation.

Even a simple comparison of the place names on the various reproductions shows that they do not match. Guillemard's representation does not show a single name in the whole of Tierra del Fuego. Doppelmayr and Lelewel only note Coyl in the north-western tip. The Encyclopaedia Britannica gives Coilur in the south and Calmia in the north. Jomard's reproduction shows a long text written on the background of the ocean right next to the west coast of the peninsula.

VI.2. St. Thomas in Tierra del Fuego

In photos from the Berlin magazine, the word Coilur can be read in large letters in the central part of Tierra del Fuego.

Further to the southeast, on what is now the Mitre Peninsula, only the first two words of a long but illegible note can be deciphered: “The Lant” — this is not very informative.

I couldn't find the word Calmia from the Encyclopaedia Britannica in the photos.

To the side of Tierra del Fuego, against the background of the ocean, today's
Globus, where Jomard reproduces a twelve-line inscription, only a three-line almost completely legible remark:

In this island of Coylur, Sct
tobmas the Tw... was martyred

In the first line, the word island attracts attention; for Tierra del Fuego, right next to the inscription, is evidently a peninsula, as on all maps before the discovery of the Patagonian Strait by the fleet of the spice merchant Christoph von Haro in 1514 (53). The only exception is an Arabic map, which will be discussed in Chapter X.

In the first line, Coylur is the spelling that can be found in Marco Po-lo's report for the country called Coylum on maps with Latin text; in Waldseemüller it is called Coilum.

The spelling tobmas in the second line is meaningless, as such errors are abundant on the Nuremberg potato. There was no established spelling at that time.

The word vol in the third line is not very legible; but I assume that it corresponds to today's voll or wobl.

This results in the following translation into our modern German: In this island of Coylur Saint Thomas the Tw... was fully (wobl?) martyred. "Fully" or "probably martyred" means "martyred to death" or "probably martyred". The noun beginning with Tw... is without doubt a nickname for Saint Thomas. This apostle was also called Didymos according to the Greek translation of his Aramaic name, and that means "twin" in German, which satisfactorily complements my reading.

VI.3. The authenticity of the mention of Saint Thomas

I have already mentioned that the Nuremberg potato is covered with inscriptions of varying ages. How old and how authentic can the mention of Saint Thomas be?

Judging by the writing, this mediocrely preserved text is neither one of the newer additions nor one of the original notes that have become completely illegible. On the other hand, the photo does not give the impression that the text has become illegible and has been renewed. One remains perplexed unless one compares it with other reproductions of the globe.

In the 19th century, Jomard found a twelve-line text at the same place. From this we can conclude that this inscription was written by a restorer after Jomard, perhaps by Barfuß, and that he was of the opinion that these twelve lines were an erroneous addition by one of his predecessors.

The restoration of a map must consist of removing later additions and restoring the original drawing and wording. Was the mention of Saint Thomas really part of the original text?

To answer this question, I consulted other maps from the same period.

Saint Thomas can also be found on Waldseemüller's map of 1506/07 just north of the Patagonian Isthmus, as well as on the fan-shaped map of Contarini and Rosselli of 1506. Since these two maps may have copied Behaim, it can be considered very likely that

St. Thomas on the Nuremberg Potato appeared before 1506, the year in which not only the two cards appeared, but also Behaim died.

However, this is not an absolute guarantee of authenticity, because Behaim left Nuremberg soon after completing his globe, returning to the Azores and Lisbon. It is not inconceivable that the globe was worked on by another hand in Nuremberg between 1492 and 1506, i.e. during the author's lifetime, but without his knowledge.

This doubt, however, has little significance, since we also find St. Thomas on Hammer's Ptolemy map of London, drawn in 1489.

Here is a comparison of the texts of these three cards:

— Waldseemüller Hic occisus S. thomas Here St. Thomas was killed — Contarini-Rosselli Civitas S. Thomae City of St. Thomas

— Hammer Hic S. tomas occidit Here died St. Thomas

The conclusion is clear: the allusion to the death of St. Thomas corresponded to the mentality of the time. It is found both in Behaim's model, Hammer, and in those who copied him, Waldseemüller and Contarini-Rosselli. On the Nuremberg potato this inscription was obliterated and replaced before the time of Jomard, and it was renewed again during the last restoration, perhaps as a faithful copy of the original.

Now it remains to explain the presence of Saint Thomas in Tierra del Fuego or Patagonia.

There is a legend according to which the apostle was sold as a slave to a merchant travelling to India so that he could preach the gospel there. The saint built a castle there for King Gundophorus or Gondiffer (212) and was martyred in La Calamine. His grave in Mailapur near Madras on the Coromandel Coast is still preserved today.

Nicolo Conti visited it in 1420 (24) and the Portuguese built a chapel there in 1547.

VI.4. India in the narrow and broad sense

In this and the previous chapter it became clear that geographical facts which belong to Asiatic India were transferred by numerous geographers, including Waldseemiiller and Behaim, to the Dracbenswan, that is, to South America. These are Seylam (Ceylon), the Indonesian islands and the death of Saint Thomas. These three confusions find their clear explanation in the confusion between India in the narrower sense and India in the broader sense, which prevailed throughout the period up to the 16th century.

The word India was used by Herodotus (89 111 98—106) and by Ctesias (31) to refer to the Indus river basin. Onesikritos extended this term to include the largest part of India. Megasthenes reported on the vast area beyond the river in connection with his stay on the banks of the Ganges. The Greek world was thus faced with the need to define the geographical term Indiem, which had become too broad, and distinguished India Cisgangetica, India on this side of the Ganges and India Transgangetica, India beyond the Ganges. Marinus of Tyre knew of the journey of the envoy of the Macedonian merchant Maes Titianos through Bactria and Sogdiana to the land of silk. Since these areas also lie in the east, they were also incorporated into India and

formed India Superior, Upper India, a term that remained in use for China until the 16th century.

Finally, Marinos received information from Alexandros about the country of Kattigara, across the seas, far to the southeast of China, "on the border of the unknown world" (104 I 43). Since this country lies southeast of India Superior and India Transgangetica, it was called India Meridionalis, South India, a name that also remained in geography until the 16th century.

India in the narrower sense is today's Asian India, the Indian subcontinent, the India Cisgangetica (India intra Gangem) of the ancients. India in the broader sense is divided into India Cisgangetica, India Transgangetica (Inda extra Gangem)
India Superior and India Meridionalis are formed.

When the medieval cartographers learned of the existence of an island called Seylam south of India, they placed it south of India in the broader sense, that is, south of the Dragon's Tail, south of Patagonia. Ruysch, Contarini, Waldseemüller and before them Behaim and others did the same.

They also knew that Java and other Indonesian islands were located southeast of India and located them in the southeast of India in the broader sense, India Meridionalis, i.e. in the Atlantic.

And when they learned that Saint Thomas had died in southeastern India, they recorded this fact in India Meridionalis, that is, in Patagonia.

VI.5. The Tehuelches

After these basic remarks, let us return to Tierra del Fuego on the Nuremberg Earth. I would not like to leave it without giving new evidence of the knowledge of Tierra del Fuego that European cartographers possessed even before the official discovery of America.

The inscription Das Lant, which could no longer be deciphered on the Berlin photos, I found clearly legible on the reproduction in segments that the Geographical Service of the Spanish Army has. The text there reads:

The lant is called Cytisella.

This inscription, placed in the middle of the land of Coyle, confirms that its inhabitants ner are the Tehuelche, because as already mentioned, in the small dictionary Italian — Alakaluf by Father Borgatello (19) we read:

Indi Tebuelci Ciettistar

These are two linguistic notes, made more than five centuries apart by an Italian and an informant of unknown origin. The correspondence between Cytisella and Ciettistar is convincing. It is therefore certain that the Tebuelcbe are mentioned on the globe made by Martin Bebaim in Nuremberg in 1492.

They were marked with the greatest precision in the south of Patagonia, in the land of Coyle.

VII. The London Ptolemy Map by Hammer (1489)

VII.1. The cartographer Heinrich Hammer

In this chapter I will present the best map of South America drawn before the first voyage of Christopher Columbus; at the same time it is the most complete and correct representation of the South American river network made before the middle of the 19th century.

It is the dragon's tail on the Ptolemy map by Heinrich Hammer, which is kept in the Department of Manuscripts of the British Library in London (84). The cartographer Hammer worked in Florence and Rome between about 1480 and 1496. He had the habit of writing and signing in Latin: Henricus Martellus Germanus and usually worked with the engraver Francesco Rosselli, whom I have already introduced as a cartographer.

Hammer is known to have made several very interesting maps of Central Europe, particularly his map of Germany. He belonged to the school of Cardinal Nicholas of Cusa (1401-1464),'^ the wise bishop of Brixen in South Tyrol, a great mind in philosophy, theology, mathematics, geography, astronomy, public law, legal history and in numerous other fields (77).

The Superintendent of the Cartographic Department of the British Museum, RA Skelton, wrote of the maps: "In 1487 Bartolomeu Diaz penetrated as far as the Indian Ocean, thus opening the sea route to India. When he dropped anchor in Lisbon, Christopher Columbus was standing on the quay. The news soon reached Florence from the Tagus, where it was used in a map by Henricus Martellus Germanus the following year (1489)" (193).

The world maps drawn by Hammer recall the past and herald the future. Since all Portuguese maps of the 15th century have been lost, Hammer's Ptolemy maps are the oldest cartographic evidence of the travels of Diego Cao in 1485—87 and Bartolomeu Diaz in 1487—88.

Hammer modified the Ptolemaic maps of Asia based on Portuguese information about the Indian Ocean and the description of the Far East by Marco Polo and Nicolas Conti. He followed Toscanelli's view of the entire length of Eurasia and the length of the Sea of Darkness, the Atlantic.

The representation of the earth on Hammer's weakest map, which is at Yale, became the cartographic basis on which his successors grafted their new discoveries. Its wide circulation suggests that it was based on the press of

12 Lat. Nicolaus Cusanus, actually N. Cryfftz or Krebs (77).

13 The Lisbon earthquake of 1755 destroyed the archives containing the most strictly confidential documents about the expeditions. Some of the maps that still exist have mostly found their way to Italy through espionage or theft.

Rosselli. Hammer's influence on the cosmographic ideas of Christopher Columbus, Amerigo Vespucci, Sebastiano Caboto and Fernando Magellan can be seen, as well as on the cartographic production of the workshops throughout Western Europe, in Portugal, in Italy, in the Rhineland, in Lorraine and in Franconia.

VII.2. The Ptolemy maps by Hammer

Today, four Ptolemy maps by Hammer are known, all of which appear to have been made in 1489: the printed wall map, which is in the Beinecke Library of Yale University, and the three manuscript maps, which hardly differ from one another and belong to the three copies of the Insularium Illustratum Henrici Martelli Germani (Figs. 32, 33, 34), which are in the British Library (84), the Central Library of the University of Leiden (85) and the National Library in Florence'*.

The outline and geographical location of South America are exactly the same on all four maps. Nevertheless, it does matter which map I use for my further research, because they differ in the way they depict the interior of the continent.

The Ptolemy map from London contains the place names Reg-

num Lac and Regnum Coylum, as on the map by Waldseemüller, but in Hammer these two names are not accompanied by a commentary belonging to Asia.

Hammer's map from the British Library is of great importance for the history of cartography of South America before Columbus, because it shows all the major rivers, as I will show in this chapter. This

Ptolemy's map was reproduced by numerous authors: Johann Georg Kohl 1856 (117), Jose de Lacerda 1867 (124), Adolf Erik Nordenskiöld 1897 (157), WB Greenlee 1937 (78), Roberto Almagià 1940 (3), Leo Bagrow 1951 (10), Bagrow and RA Skelton 1960 (11), Carlos Sanz 1962 (182) and 1970 (183), Bjórn Landstróm 1969 (127), Laguarda Trías 1973 (126) and Arthur Davies 1977 (33).

Since all these authors focused their attention on Europe or Africa, none of them noticed that this Ptolemy map represents the South American river network accurately and completely. None of them knew that the Dragon's Tail is South America.

The Ptolemy Map of Leiden has suffered considerably from moisture.
The river network is only indicated by dots, but it is identical to that of the London Ptolemy map, with the exception of the Chubut river in Zentral Patagonia, which is missing on the Dutch specimen. The mountain ranges show no differences, either in length or orientation, and in Tierra del Fuego the Dutch specimen reads lac regnum instead of regnum lac as on the London Ptolemy map.

Hammer's Ptolemy map in Yale is the oldest known map with a pseudo-heart-shaped projection, which was later used by Waldseemüller and many others. It has a total length of 275 degrees of longitude and served as a model for Martin Behaim's Erdapfel. As far as South America is concerned, the Yale map resembles those of London and Leiden only in the outline and position of the continent, but not in the surrounding islands. In addition, several details of the Atlantic coast are missing from the Yale map (Fig. 35, 36).

The South American river network on this map resembles neither the other two Ptolemy maps nor reality. For lack of a better explanation, I assume that the river network is a pure product of the imagination.

The Indonesian islands that I found on Waldseemüller's map and on the Nuremberg potato can also be found on Hammer's Ptolemy map from Yale, but not on those from London and Leiden. Behaim and Waldseemüller were right to copy Hammer, but unfortunately they chose the wrong model, the map from Yale instead of the one from London or Leiden, to put it simply.

1711.3. The river network on Hammer's Ptolemy map from London

14 A fifth map, probably a draft sketch, was found by the translator in the Bi-blioteca Laurenziana in Florence. (216).

A detailed study of the river network of the Dragon's Tail on the London Ptolemy map can be made by simple comparison with a modern map of South America (Fig. 37).

Hammer: To the north of the Dragon's Tail, a river flows from west to east into the eastern ocean. Its source is in a mountain range that runs parallel to the Sinus Magnus, but not in the range closest to the ocean, but in a parallel range a little further east.

Reality: In the north of South America, the Orinoco and its largest tributary, the Meta, flow from west to east and empty into the Atlantic Ocean.

The source of the Meta lies in the Andes, which extend parallel to the Pacific coast, but not in the western Andes chain, but in the one further east, the Cordillera Oriental.

Hammer: In the south of the lower and middle reaches of the Orinoco there is a mountain range that reaches to the eastern ocean.

Reality: South of the lower and middle reaches of the Orinoco lies the

Mountainous region of Guyana.

Hammer: South of the Guayana Mountains, the longest river, the Dragon's Tail, flows eastwards, forming large lakes and swamps.

Reality: South of the Guayana mountains, the Amazon, the longest river in South America, flows eastwards, forming swamps and huge bodies of water due to its immense width.

Hammer: Separated from the Amazon by a mountain range, a river flows into the eastern ocean; it originates in a mountain range in the middle of the dragon's tail.

Reality: Separated from the Amazon by the Serra do Alto Para, the Tocantins flows into the Atlantic Ocean; its source is in the Planalto Central, in the heart of Brazil.

Hammer: Another river originates from the same mountainous region and flows into the ocean south of the easternmost cape of the Dragon's Tail.

Reality: The Rio Säo Francisco also rises in the Planalto and flows into the Atlantic south of Cabo Säo Roque, the easternmost point in South America.

flows into.

Hammer: South of the Rio Sao Francisco, the coast is without a river mouth for a long stretch. A mountain range rises parallel to the coast.

Reality: South of the Rio Sao Francisco, the coast stretches for 3,600 km without any river worth mentioning flowing into it. The Serra do Mar rises parallel to the coast.

Hammer: The river, which rises in this coastal mountain range, flows first westward, then southwestward through the inner regions of the Dragon's Tail. There it meets a tributary coming from the north, with which it forms a mighty stream and flows southward, later southeastward, emptying into the eastern ocean through a large trumpet-shaped mouth.

Reality: The Paraná, whose major tributaries originate in the Serra do Mar, flows first westward, then southwestward through the interior regions of South America, where it meets the Paraguay coming from the north, with which it forms a powerful river and flows southward, then southeastward, emptying into the Atlantic Ocean via the large estuary known as the Rio de la Plata.

Hammer: Further south, two rivers originate in the same mountain range and flow parallel to each other to the ocean.

Reality: Further south, the rivers Rio Colorado and Rio Negro originate in the Andes and flow parallel to each other to the Atlantic Ocean.

Hammer: South of these two rivers, a large peninsula extends far into the ocean. It is the only one on the entire east coast of the Dragon's Tail.

Reality: South of the Valdes Peninsula, the Valdés River, which originates in the Andes, flows more than 100 km into the Atlantic. It is the only one on the entire east coast of South America.

Hammer: South of this peninsula a river rises in the western mountains and flows into the ocean.

Reality: South of the Valdés Peninsula, the Rio Chubut, which rises in the Andes, flows into the Atlantic.

Hammer: In the large triangular peninsula where the Dragon's Tail ends, a single river flows halfway along the northeast coast of the peninsula.

into the sea.

Reality: In Tierra del Fuego, the Rio Grande flows into the Atlantic halfway along the northeast coast of the island.

The identification of all the great rivers of South America on Hammer's pre-Columbian Ptolemy map, by simply comparing their geographical position, their main characteristics and the orientation of their most important parts, is the final confirmation of the identification of the Dragon's Tail with South America on this map and, consequently, on those of the later cartographers who copied it without knowing what it really was.

In particular, the Paraná-Paraguay system with its Y-shape open to the northeast, its lower course which turns from south to southeast and its estuary trumpet together create a picture that is unique on the whole earth.

Hammer's map shows it accurately with its shape and orientation, including the Serra do Mar parallel to the coast. The extension of the system in comparison to other rivers and its location in the continent are also correct. The Paraná-Paraguay system alone is enough to prove the identity of the Dragon's Tail and South America.

The success of this investigation prompted me to try to identify other geographical elements of this part of the Ptolemy map.

For this purpose I used the method called 'distortion grid'.

VIII. Further identifications on Hammer’s London Ptolemy map

VIII.1. The method of the distortion grid

The distortion grid method has so far only been used by a few geographers from Switzerland and Austria to determine the extent of errors in location determination on maps from the Middle Ages and the Renaissance.

Very few of these maps contain any reference to lines of latitude or longitude, except sometimes the equator and the tropics. The method of the distortion grid (Fig. 38) consists in drawing a series of meridians and parallels on the map under consideration, according to the position of the towns, mountains, rivers and coasts, which in general pose no problem of identification, since they are almost always indicated by their names.

The grid of lines of length and latitude thus obtained is distorted due to errors in the location determination. Subjecting it to a cartometric analysis enables us to discover the general principles that have been at the basis of the map's production, whether they are correct or incorrect, and to distinguish them from one another.

to distinguish between individual errors that are independent of the system and apply only to a city or a river.

In this field, the most interesting work is that of Eduard Imhof (109) on the oldest maps of Switzerland. His success has shown that the method of the distortion grid is the most effective means of determining the errors in location and, above all, of demonstrating the system of their mutual influences, which often amounts to an explanation and, to a certain extent, even to their justification.

Using the distortion grid, V. Binggeli (18), another Swiss, was able to show relationships between several maps that at first glance did not seem to be related to each other.

Following the publication of my work on the identification of the water network of South America on the London Ptolemy map by Hammer (55), I received from the University of Innsbruck a paper by Prof. Dr. Franz Mayr (143) in which he investigated the distortion grid of the Tyrol region on the map of Germany by the same cartographer, which he drew before turning to the Ptolemy maps.

The excellent results obtained by Prof. Mayr have led me to apply the same method to the South American area, ie the dragon's tail of the London Ptolemy map.

However, the problem that Prof. Mayr faced cannot be compared with mine. While the identification of geographical details on the map of Tyrol is generally not difficult, the

The situation is not so simple in the case of the dragon's tail, which was considered an outgrowth of geographical imagination until Enrique de Gandia proposed its identification with South America in 1942 (65).

The construction of the grid of longitudes and latitudes must be based on reliable and relatively numerous clues. I was able to recognize all the great rivers of the Atlantic basin, as well as several points on the coast. I must confess, however, that I did not venture to the Pacific side because of its poor network of clues, both on the Ptolemy map and in reality.

With a little luck I was able to solve the problem. The rivers and mountains of the Dragon's Tail, which I described in the previous chapter by their geographic

graphic position and its special characteristics have enabled me to construct a grid of meridians and parallel circles.

This grid, in turn, has provided me with surprising revelations about the lakes and rivers of the Pacific side and even about places on the Atlantic coast that I could not previously identify.

VIII.2. Longitude and latitude on Hammer's Ptolemy map

Longitude is not indicated on any of Hammer's Ptolemy maps.
The values printed on the margin of the Yale Ptolemy map cannot be used for comparison, because this map contains large islands east of the Dragon's Tail which do not appear on the London map.

At first glance, one might think that the length can be derived from the distance that separates the dragon's tail from the other continent in the southern hemisphere, Africa. Unfortunately, this is only a fallacy, because on this

According to some representations, the dragon's tail is near Chryse Chersonesus, in other words, South America is very close to the Malay Peninsula. This misrepresentation is due to well-known motives which I shall explain in Chapters XI and XII, and which consisted mainly in the reduction of the extent of the Pacific Ocean, brought about successively by Marinus of Tyre and Claudius Ptolemy.

The history of this cartographic reduction of the Pacific, called Megas Kolpos in antiquity and Sinus Magnus in the Middle Ages, shows that it would be futile to try to apply the relative longitudes to Hammer's drawings of the Ptolemaios maps.

The inner edge of the printed map from Yale is divided into 275 degrees of longitude, of which 5° are west of the prime meridian and 270° east. South America, where it has its greatest extent in a west-east direction, extends between 160° and 220° east longitude, i.e. over a total of 60°. This is exaggerated, because the difference between the extreme longitudes of South America is in reality only 45°.

This error in the geographical length cannot cancel out the identification of the dragon's tail, which can be based on the knowledge of the rivers. This error also confirms the identification, because it is of the same order of magnitude as the exaggeration of the length of the Mediterranean, which according to Ptolemy is 65°, compared to 42° in reality. Even more exaggerated is the geographical length of the Persian Gulf, which is 20° according to Ptolemy, compared to only 8° in reality.

These considerations clearly show that for the construction of the grid the
The course of the meridians on the London Ptolemy map is based only on the

can be established from the geographical phenomena represented on the map and identified with reality, without taking into account the longitudes indicated on the Yale map, which is the result of the errors accumulated by Marinus of Tyre, Ptolemy and perhaps by Hammer himself and his mysterious informants.

The same problem arises with the geographical latitude. The geographical latitudes could theoretically be determined by comparing them with the African coast. Yale's map shows the equator and the tropics and also has a graduation on the side edges.

Unfortunately, these figures are useless, because Marinus and Ptolemy had shortened the geographical latitude even more than the geographical longitude; more on this in the next chapters. One of Hammer's great innovations is to "stretch" the earth both in length and width; however, he seems to have relied more on reasoning than on information received from distant countries.

This also explains why the Tropic of Capricorn on Hammer's Ptolemy map from Yale intersects Tierra del Fuego, which is already a great advance, because according to Ptolemy the world simply ended at 14^ s. Br.

It is therefore understandable that I can only rely on the identified geographical conditions for determining the meridians and parallel circles of the grid.

VIII.3. The construction of the grid

The elements I have at my disposal to construct the grid are, in order of importance: the rivers, the coast and the mountains. On the Ptolemy map of London (Fig. 39), I draw the parallels of latitude at 10" intervals, taking my lead from a modern map of South America.

The parallel 10^ N runs parallel to the course of the Orinoco Meta and remains below the grid.

The equator enters the continent at the mouth of the Amazon, passes north of this river and cuts the south of the mountainous region of Guayaquil.

na. It crosses a swampy area, which must be that of the Rio Negro, cuts the Andes south of the source of the Rio Magdalena and finally reaches the ocean.

The resulting grid shows that the equator runs straight between the Atlantic Ocean and the Rio Negro swamp, then shifts southwards and returns to its normal direction. This is a very small

Distortion.

The parallel 10^ s. Br. meets the continent south of the Cabo de São Roque, near the mouth of the São Francisco. It runs successively north, then south, then north again of this river, cuts the upper course of the Tocantins, then runs parallel to the Amazon, and finally reaches the Pacific.

The parallel 20° south latitude cuts the coastal chain, then the upper reaches of the Paraná and Paraguay rivers. It crosses the Bolivian Cordillera Central and the Altiplano and passes south of Lake Titicaca before reaching the Pacific.

The parallel 30° south latitude penetrates into Brazil south of the Serra do Mar. Then it intersects the Paraná between Corrientes and Santa Fé, where the river flows south. From there on, the Ptolemy map lacks points to which one could refer, so I extend it straight west.

The parallel 40° south latitude cuts the coastline between the mouths of the Rio Colorado and Rio Negro and continues westward.

The parallel of 50° south meets the continent north of the Strait of Magellan, shown on Ptolemy's map as the Patagonian Isthmus. The lack of detail on the map does not allow for greater accuracy.

The determination of the meridians follows the same principles.

The meridian 40° W.L. of Greenwich passes between the mouth of the Tocantins and Cabo São Roque, then, after crossing the Rio Sio Francisco, it cuts the coast again, a little north of Cabo Frio.

The meridian 50° W. L. passes through the mouth of the Amazon, where it intersects the equator, then it runs near the sources of the Tocantins and west of the Rio 530 Francisco. It then cuts the upper reaches of the Paraná and the south of the Serra do Mar and reaches the coast at 30° S. Br.

The meridian 60° w. L. reaches the continent near the delta of the Orient.

noco. It cuts through the swampy area near Manaos, runs west of the Mato Grosso, reaches the Paraná, which it intersects at 31° and 33° south latitude, and reaches the Atlantic again at 39° south latitude.

The meridian 70° W. L. crosses the Meta and the upper reaches of the Amazon and leaves the Cordillera Oriental of Colombia to the west. It crosses Lake Titicaca and approaches the Pacific coast at 20° S. latitude. Up to 36° S. latitude it runs close to the main ridge of the Andes, cutting the upper reaches of the tributaries of the Rio Colorado and the Rio Negro, as well as the upper Chubut. It

cuts the Patagonian Isthmus (Strait of Magellan) and reaches the ocean

south of Tierra del Fuego.

The meridian 80° W. L. reaches South America under the equator and leaves it south of Punta Aguja, which was identified by Ibarra Grasso with the Promontorium Satyrorum of Ptolemy (106, 181 and 183). It continues in the ocean parallel to the Chilean coast.

VIII.4. Cartometric analysis of the obtained grid

The grid I received is significantly less distorted than the one Prof. Mayr for the map of Tyrol (143).

The parallels of 30°, 40° and 50° S are remarkably parallel to each other and have not suffered any deformation. The parallel of 10° S had to move a little to the north to intersect the Tocantins. The equator has made a similar movement to avoid the swamps of the Rio Negro and the upper Amazon to the north and must return to the south to leave the sources of the Rio Magdalena to the north. The slight deformations are parallel and therefore justify each other.

The meridians 40 and 80° w. L. are almost perfect. The meridian 50° w. L. deviates to the west, leaving the source of the Rio São Francisco to the east. The meridian at 60° W. L. follows exactly the same movement, since it is a movement initiated by the meridian at 50° W. L. deviates only as far to the east as is necessary to leave the sources of the rivers Colorado, Negro and Chubut to the west.

The incorrect location information on Hammer's Ptolemy maps from London and Leiden only concerns a tiny part of the geographical features shown on these maps. The cartographer made only two key errors: he placed the Planalto of Brazil too far to the west and the sources of the Patagonian rivers too far to the east. In both cases, these are geographical facts that remained unknown for several centuries after Hammer: the Planalto until the 17th century and the sources of these Patagonian rivers until the middle of the 19th century.

The end result of this analysis is that Hammer's pre-Columbian Ptolemy maps are of a remarkable reliability and accuracy that cannot be explained by the current state of knowledge of the history of discoveries.

The analysis of the grid thus obtained allows further identifications to be added to those of the previous chapter.

The course of the equator has led to the recognition of the swamps of the Rio Negro, northwest of the Amazon, and of the Rio Magdalena, which flows between the Cordillera Occidental and the Cordillera Oriental in Colombia.

The course of the parallel circle 10^ s. Br. reaches the Sinus Magnus at the mouth of the river Saenus. The shape of its course is unmistakable: it comes

from the southeast before turning at right angles to the Pacific. This allows it to be identified as the Rio Santa, which flows northwest between the Cordillera Blanca and the Cordillera Negra for 170 km and reaches the ocean at 9” south latitude north of Chimbote. No other river has this shape.

The parallel 20° S. Latitude leads, before reaching the Pacific, past a confluence which I assume is that of the Rio San Pedro and the Rio Loa in the north of Chile at 22? S. Latitude. This is a

Assumption based on the shape of the Fluftlauf and its lings.

The parallel circle 30° s. Br. intersects the same river as that of 20° s. Br.
This is undoubtedly a mistake.

The parallels 40° and 50° S. latitude, in conjunction with the coastline, enable the identification of Cabo Tres Puntas on the Atlantic at 47° S. latitude. On the Pacific coast there is simultaneously a great revelation and a great problem.

Between the two parallels, at about 46? S., is the angle which marks the general coastline of the western side of the Dragon's Tail, according to the maps. Now the coastline of South America forms a similar angle, but at Arica, at 18? S. This difference of 28? is enormous, and if one accepts the identification with Arica, it would be the only great error of the Ptolemy map in the Dragon's Tail.

Such an error suggests a general shift of the Pacific coast to the south in relation to the Atlantic coast and the river network. However, such a shift is contradicted by the identification of the Rio Magdalena, the Rio Santa and Lake Titicaca, which are correctly drawn. For this reason, I am reluctant to accept an error of 28° based on nothing more than an angle formed by the coast.

Within this angle, a large bay closed on three sides is marked on the Ptolemy map. According to the grid, this bay lies between 40 and 50° south latitude. Only the Gulf of Ancud or perhaps its immediate

Neighbor, the bay of Reloncavi meets these conditions. I will return to this topic in connection with the riddle of Kattigara.

The course of the meridian 40° W. L. enabled the identification of Cape Frio.

The meridians 50° and 60° W. L. intersect well-known areas and confirm the identification of rivers without providing new insights.

The meridian 70° W.L. intersects the only lake shown on the Ptolemy map in the Cordilleras; the lake is located at 16° S.L., on the same latitude as the Planalto do Brasil; there is therefore no doubt that it is Lake Titicaca.

The meridian 80° west longitude confirms the general orientation of the Pacific coast.

The method of the distortion grid has, on the one hand, confirmed the entirety of my previous discoveries concerning the large rivers,

On the other hand, it also enabled the identification of numerous points on the coast, Lake Titicaca and several rivers on the Pacific side. This is much more than I could have hoped for. The existence of Hammer's map of 1489 shows that Christopher Columbus had excellent maps of South America at his disposal.

IX. South America on the medieval cycling maps

IX.1. Criteria for identifying South America

I wondered if Hammer was really the first cartographer to South America in the shape of the dragon's tail with its two sea coasts has presented.

The geographers of antiquity, especially Marinus of Tyre and Claudius Ptolemy, already knew of the Pacific Ocean, which they called Megas Kolpos or Great Gulf, because they thought it was closed in the north. This conception is equivalent to the idea that East Asia and South America were connected by a large land bridge; it was retained until Giulio Sanuto's map of 1574. Marinus of Tyre and Ptolemy represented part of the eastern shore of the Pacific, that is, part of the Pacific coast of South America, where they transferred the anchorage (Hormos, Ópuoc) of Kattigara, to which a separate chapter is devoted in this book (71 and 106). Hammer, on the other hand, represents the entire Pacific coast and also the Atlantic coast and the interior of the country.

The search for Hammer's sources must concentrate on the period between antiquity and the Renaissance, between the 2nd and the 15th century. In other words, there is hope of finding his precursor and perhaps also his model in medieval cartography.

Unfortunately, "the cartography of the Middle Ages has degenerated into the most implausible fantasies," as Armando Cortesão wrote (25 27). It offers us mainly TO maps, or the Earth as a flat round disk divided into three continents by seas, which together form the shape of a T.

‘had given up the belief in the spherical shape of the earth, which the Greek geographers had already correctly recognized.

On this flat disk surrounded by water, the world of the Christian cartographers of the Middle Ages, it seems impossible to find a large protruding peninsula that could be the dragon's tail.

However, I wanted to identify an identifying feature for South America so that I could find it on maps where it does not appear to be represented, at least at first glance. And I succeeded.

I have observed that on all the maps that I have examined, starting with Sebastian Münster's map of 1532, through the most famous ones, such as Waldseemüller's map of 1507 and the Nuremberg Erdapfel, up to Hammer's map of 1489, one always finds the same sequence east of India Cisgangetica, ie the Indian subcontinent:

— the Sinus Gangeticus or Bay of Bengal,
— Aurea (Golden) Cbersones or the Peninsula of Malacca, — the Sinus Magnus or Pacific Ocean,

— a vast peninsula extending far to the south, sometimes called India Meridionalis, forms the dragon's tail, and is South America.

In all maps that use this type of representation, it can be seen that this sequence is also an identifying feature for its different elements. This method makes it possible to trace the trace of South America on the maps of the Middle Ages.

IX.2. The medieval cycling maps

Few historians of cartography have devoted themselves to the study of the cycle maps of the Christian Middle Ages. Most of them have focused their attention on the artistic element, the miniatures, legends, monsters, or even the distortions in the representation of Europe and Africa. None of them can be said to have been interested in the Dragon's Tail. And if someone happens to mention it, it is only to state that this peninsula is "pure fantasy."

On these maps, Jerusalem is almost always the center, because it seemed obvious that Jesus Christ had to live and die in the center of the disc-shaped earth that he had come to save. On the other hand, the legends and traditions included in these maps clearly state that the earthly paradise is "far to the east," and so it has generally been placed at the very edge of the earth, near China. This view was reinforced by the theories that explained the origin of the humanity to the East.

At first glance, these cycling maps look very similar. However, a closer examination reveals fundamental differences.

IX.3. Walsperger's map of 1448 (Fig. 40 b)

Some cycle maps from the first half of the 15th century show the sequence of features I have compiled. This is most clearly shown by the famous map by Walsperger; Almagià (4) and Durand (46) have commented on it in detail, but have overlooked the fact that South America is shown on it.

Not much more is known about Walsperger than what is written on the map: "hec mappa per manus ,, The fact is fratris Andree Walsperger ordinis Sancti Benedicti de Salis-burga, Anno Domini 1448 in Constantia", in German: "This map was made by the hand of Brother Andreas Walsperger of the Order of Saint Benedict of Salzburg, in the year of our Lord 1448 in Constance." Despite a few hypotheses, nothing else is known about the monk.

This map was published in 1891 by Konrad Kretschmer in the Vatican Library.
thek. The colors are very fresh. The earth, with a diameter

of 425 mm, is surrounded by the celestial spheres and the elements; the whole has a diameter of 575 mm.

The parchment on which this map was drawn has been partially restored. It occupies the first page of the manuscript Codex Palatinatus Latinus 1362P, a collection of nautical charts with no apparent relationship to the circular world map.

Kretschmer, who was the first to point out his discovery (120), also published a sketch of this map, which, together with thirteen others, forms Plate III of his Atlas of the Discovery of America (121). But although he focused his attention on this phenomenon, Kretschmer did not see South America on Walsperger's map.

The compilation of identification features increases my chances.
In fact, in the south of Asia, where India Cisgangetica should be, one notices a certain confusion. Then there is a deep gulf without a name, which can undoubtedly be identified with the Simus Gangeticus, because it is bordered on the east by an almost square peninsula with a clearly legible name: Aurea kersonesis. This is the present Malacca peninsula. Further to the east there is another nameless gulf, which, according to the sequence of characteristics I have compiled, is the Sinus Magnus. Then follows a huge peninsula which extends far to the south.

According to the maps already examined, this is the dragon's tail, i.e. South America.

The southern tip of South America bears a note: Hic sunt gigantes pugnan-tes cum draconibus, "Here live giants who fight dragons." The origin of this and other legends can easily be found in the literature of the time, in Pierre d'Ailly, Mandeville, etc.

It is, however, very remarkable that the existence of giants was reported as early as 1448 and, as I shall show, as early as 1440. The current opinion is that the origin of the legend of the Patagonian giants lies in the report of Pigafetta, Magellan's chronicler, dating from 1522. Pigafetta was a learned man who, like Magellan, saw in the tall Tehuelche of Patagonia the confirmation of the stories of giants contained in the geographical books of his time and also the confirmation of the references to Walsperger's map or any other very similar map that he could consult.

What are these dragons supposed to be? Probably the well-known Mylodon (Edentata Tardigrada), a species of giant toothless herbivorous animals that lived in southern Patagonia, especially in Magallanes (Chile), after the Ice Age, and were hunted and slowly exterminated by the ancestors of the Tehuelche, around 3000 years BC (19a).

IX.4. Other cycling maps of the 15th century

In his very interesting study of some 15th century wheel maps, Dana Bennett Durand (46) illustrated three maps depicting the Malacca Peninsula and South America. They are:

— Map XIII: anonymous, called Nova Cosmograpbia per totum circulum (Fig. 40 a), one of the Vienna-Klosterneuburg maps from around 1440, which was reconstructed by Durand on the basis of the text of the Codex Latinus Monacensis 14 583, fol. 236 r° to 277 BC.

— Map XV, the already described map of Walsperger (Fig. 40 b) from 1448.

— Map XVI, also anonymous, called "Map of Zeitz" (Fig. 40 c), because it is kept in the Abbey Library of Zeitz, a small German town south of Leipzig. It dates from 1470.

The first of these three maps is written in German, the other two in Latin. Their belonging to the same map family and the commonality of their sources is made clear by a comparison of the texts relating to the Malacca Peninsula and Patagonia.

New Cosmographia Walsperger-Zeitz

1440 1448 1470

Kuning Kaspers p a> Aurea Chersonesis
Malacca Berlin Hix rex Caspar Regi

8 habitavit SC

The giants fight Here we are giants, giant men
Patagonia and fight against pugnantes cum pugnant cum

dy lint worm draconibus draconibus

ege

For the Malacca peninsula, the maps of 1448 and 1470 mention the Golden Chersonesus in different spellings. The map of 1448 adds that King Gaspar, one of the Three Magi, lived here. The Nova Cosmograpbia map does not mention the Chersonesus, but points out that this is the mountainous region of King Gaspar, which confirms the identification of the peninsula, which was otherwise already obvious from the design of the map.

For Patagonia, the maps of 1448 and 1470 state that giants live there who fight dragons, which agrees with the German text of the map of 1440.

Here, South America can be identified on a map from 1440, but in a simplicity and lack of detail that leaves the question of the origin of Hammer's information unanswered.

IX.5. Cycling maps from the 14th century

In his Monumenta Cartograpbica Vaticana, Roberto Almagià (4) published and commented at the beginning of the third volume on the circular map of the earth from the treatise De Mappa Mundi by Paolino Minorita from around 1320, which comes from the Codex Vaticanus Latinus 1960, fol. 264 BC. The map has a diameter of 248 mm and its colours are reddish to brown. The coastlines are drawn in black and the seas are painted green.

128 years older than Walsperger's map, Fra Paolino Minorita's map contains much less detail. But it shows the same huge peninsula in the far east, stretching far to the south. Although it does not contain any place names, a comparison with the maps examined so far allows us to see that

that it is the same peninsula that I identified as South America, as Hammer and the other cartographers did.

Two other maps published by Almagià show, without further details, a comparable peninsula, which according to my identification criteria

South America must be:

— Map V in Volume I, by Pietro Vesconte of Genoa, of 1320 or 1321, is contained in the Codex Palatinatus Latinus 1362^.

— Map X in volume I, by Marin Sanudo il Vecchio, of the same period, comes from the Codex Regin. Lat. 548. This map was also published by Norden-skióld in his Periplus (157).

Among the maps examined, Walsperger's shows better than any other that Magellan, after crossing the Atlantic, had to follow the South American coast very far south until he reached the

Tehuelche inhabited area and how he then turned west and had to sail through the straits leading to the Pacific. Magellan would therefore have had an excellent guide in Walsperger's map for the execution of his expedition.

IX.6. South America on a map from the 5th century?

My excellent and generous friend Dr. Carlos Sanz Lopez, of the Royal Geographical Society of Madrid, has devoted a very interesting study to the maps accompanying the commentary on Scipio's Dream by Macrobius, written in the fifth century and contained in the manuscript Parisinus Latinus 6370 of the Bibliothéque Nationale of Paris (183 26—39).

Dr. Sanz emphasizes the division of the globe into four parts, which Macrobius taught. These parts are not connected to each other in principle and each form its own oikumene (living space). This idea corresponds perfectly to the Horismos tetrados tes oikumenes, a text that was written between the

Greek and Arabic geography. These ideas were not new, by the way; Pomponius Mela had already proposed them in the first century AD.

The commentary of Ambrosius Theodosius Macrobius is a treatise on a passage from Cicero's "De re publica" (Republic) in which Scipio Aemilianus sees his grandfather Scipio Africanus in a dream, who describes our planet to him in the following words: "Behold the earth. It is surrounded by circles that delimit the climatic zones. The outermost zones around the poles are covered with ice; the middle zone, the largest of all, is burned under the rays of the sun. There remain only two that are habitable; but the peoples of the southern temperate zone opposite us are to us as if they did not exist'' (200a).

We are interested in the Macrobius edition that was published in Brixen, the place of work of the wise bishop Nicholas of Cusa, who promoted all sciences, especially geography (134). This book contains a "world map" attributed to Macrobius (Fig. 41), which shows the south and southeast of Asia far better than other maps of the 5th century. From the Red Sea to the east, the Arabian Peninsula is shown first, the correct length but too narrow. Then comes the Persian Gulf, easy to recognize because it lies south of Babil or Babylon. Further east is the land of Partia, the land of the Parthians and Persians, present-day Iran, followed by a large triangular peninsula with its tip pointing south. This is India Cisgangetica, present-day India, which one is surprised to see much better represented than on the best maps of the Renaissance, Hammer and Waldseemüller.

The most remarkable thing, however, is that from the northeast of India a long narrow land bridge connects the Asian continent with a huge peninsula that extends far to the south, just as on the maps of the 16th century South America is connected to the Asian mainland by the Central American Isthmus.

The only possible interpretation is that it is the Dragon's Tail, that is, South America, with the unexpected feature, however, of being united with Asia by a land bridge, the earliest representation of which I have seen in Zorzi's sketches of 1503, whereas on the maps of the 15th century, including Hammer's excellent map, the union extends over the whole breadth of the southern continent.

It is important to note at this point that we cannot say with certainty that Macrobius himself drew the dragon's tail on his map. In fact, the manuscripts of the Commentary on Scipio's Dream do not contain this cartographic detail. Can we therefore conclude that this map was added in 1485 by the editors of Brixen to illustrate Macrobius' text?

I do not believe this, because this map does not belong to the immediately preceding family of Walsperger's map type, but neither does it herald the following family of Hammer's map type. On the one hand, it seems that the drawing was made in the 15th century, especially because of the inscription that surrounds the earth, but the cartographic conception probably comes from Macrobius.

Does the model for this map really come from the 5th century? Did the 15th century draftsman add his own ideas? The current state of our knowledge does not allow a definite answer to this question.

In any case, even if the narrow land bridge is the work of the draftsman or imitator, the Macrobius edition published in Brixen in 1485 represents the earliest representation of the Central American Isthmus.

X. The Arabic map of al-Hwarizmi 833

X.1. The Arabic cartography of the Middle Ages

The previous chapter has shown that Christian cartography of the Middle Ages was almost exclusively limited to the drawing of round world maps influenced mainly by biblical texts.

The Arab geographers were only slightly guilty of this error, except in the western part, in the centers of mixed culture. The best-known case is that of al-Sherif al-Idrisi (Abu 'Abdallih Muhammed ibn Muhammed ibn 'Abdallah ibn Idris al-Hammidi, 1100—1162), the Moroccan-born cartographer of the Norman king Roger II of Sicily. Al-Idrisi is the creator of the famous Tabula Rotunda Rogeriana of 1154, in which he attempted to unite Arab and Christian ideas in the field of geography.

On this large silver tablet, as on the other smaller maps that Idrisi had made, the Arabic contribution occupies the main part, since it represents the legacy of Ptolemy lost in the Christian world but preserved in the cultural centres of the Near East, mainly at the court of the Caliph of Baghdad, where the Geograpbiké Hypbégesis had been translated in the 9th century.

Harun al-Rashid, Caliph of Baghdad from the Abbasid dynasty from 786 to 809, encouraged astronomical studies and the calculation of lengths and latitudes.

His son and successor, al-Mamun, who was caliph from 813 to 833, surrounded himself with mathematicians, astronomers and geographers. He recommended that they study the writings of Ptolemy and commissioned them to produce a critical translation. In 820 he founded the Observatory of Baghdad and one of the most important works carried out during his reign was the re-measurement of latitude and its comparison with the results obtained in antiquity.

During al-Mamun's reign, the Geograpbiké Hypbégesis was translated into Arabic, including the corresponding maps by Agathodaimon. The conflicting information about the author's identity suggests that this work was carried out several times. The oldest known version is by Abdalläh ben Hor-Radadbeh, also called Abd-Allah ibn Kurdadbeh (14). De Goeje has shown that this geographer published two editions of his book in 846 and

886 (75), but all copies have been lost.

Al-Idrisi certainly knew the work of Ptolemy. But one of the best experts of medieval geography, Joachim Lelewel, believes that it was the Greek text rather than an Arabic translation (131). On the other hand, ibn Abdallah Mohammed ibn Bakr az-Zuri, who lived at the same time

lived in Granada, in an introduction to his book al-Kitab al-Djagräfiya or Book of Geography, that he copied his map of the earth from al-Qumari, who in turn had copied it from Abdallah al-Mamun, and that 70 philosophers from Iraq had collaborated on this image of the earth (152).

The geographers from Baghdad knew the areas neighbouring Mesopotamia and, to a certain extent, the Middle and Far East far better than Ptolemy.

The work on the Arabic translation of the Geograpbiké Hypbégesis made its errors and mistakes clearly apparent. The scholars of Baghdad therefore undertook the task of correcting and supplementing them.

“The geographers commissioned by al-Mamun to translate the Greek Geography have completed their task with many reservations regarding the methods and rules of geographical science, but as far as the rest is concerned they have not remained faithful to it and have written their own treatise” (131).

The oldest of these adaptations, of which a copy has come down to us, is the adaptation by al-Hwarizmi.

X.2. Al-Hwàrizmi

Abu Djafar Muhammed ibn-Musa al-Hwarizmi, called the Kharismian or Khorezmian, was an important mathematician. In this context, however, I am only interested in his geographical work, because here I can pick up the trail of the dragon's tail again.

The Uwarazmi of the Persian cuneiform texts, the Hwairizem of the Avesta, the Kbuwarizm of the Abbasid period was initially the area south of the Aral Sea around the city of Khiva (Chiva), in the great valley of the Amu Darya. From 994 to 1231 there existed a state called Khowaresm, Kharism, Choresm(ia) or Khorasan, which extended to the Caspian Sea and was destroyed by Genghis Khan. Its inhabitants are the Kharismians or Choresmians.

As the end of his name suggests, this geographer must have come from this area, although he was sometimes called al-Qatrabbuli, which connects him with the city of Qatrabbul on the Euphrates. Finally, also referred to him as al-Madjüsi or the Magician, which suggests that his family may have been followers of the religion of Zarathustra.

Al-Hwarizmi entered the service of the Caliph al-Mamun at a very young age, in the Dar al-Hikma or the House of Wisdom, that is, the great library of Baghdad. His main work, completed in 833, is entitled Kitab Surat al-ard or Book of the Image of the Earth or also Rasm al arsi, Rasm el ardi, Description of the Earth or Rasm al ra-ba al mamuri or Rasm ar rub al Mamur or abbreviated simply Rasm, Description of a Quarter of the Inhabited Earth, a Quarter of the Oikumene, which is reminiscent of the theory of Macrobius.

Al-Hwarizmi is much more than a translator for the Geograpbiké Hypbégesis, he has corrected and supplemented it. He treats the work of Ptolemy as the latter treated that of Marinus of Tyre, but with much more success: he takes over everything that he considers good and correct, criticizes and reforms what he considers wrong, and adds everything that he considers useful, all while maintaining the general structure of the original work.

All in all, the geographies of Ptolemy and al-Hwarizmi differ greatly from that of Marinus of Tyre, which it modeled on. All three works are mainly lists of cities and geographical locations throughout the world, with their latitudes and longitudes, and a general introduction.

One of the corrections that al-Hwarizmi made to the Alexandrian's work was the reduction of the length of the Mediterranean from 62° to 52°, while in reality it measures only 42°. The Arab chose the same main meridian as Ptolemy, that of the Isle of the Blessed or Canary Islands, and his oikumene also extended over 180° longitude.

According to Lelewel, what al-Hwärizmi had taken as the basis of his translation, or more precisely, his adaptation, was not the Geographike Hypbé-gesis but a reworking of that work made by a group of Arab and Christian scholars from Asia Minor, who called it Horismos tetrados tes oikumenes, or Image of the Inhabited Quarter of the Earth, and the Arabs had made of Horismos Rasm, which includes the meaning of description, figure, face, image, sight, and even composition, construction and structure.

In this case, the author of the Horismos would be an anonymous group that was led by the Alexandrian, but was clearly superior to him. However, according to Arabic tradition, the author of the Horismos was called Batlaimus, a name that is an Arabic corruption of Ptolemy.

In the 10th century, al-Mas'udi claimed to have seen the geography of Ptolemy and that of Marinus of Tyre. He considered the map of Marinus and that of al-Mamun (i.e. al-Hwarizmi), on which so many scholars had collaborated, to be the best. It shows the earth and the celestial spheres, the stars, the land, the sea, the deserts, the inhabited regions of all peoples, the great cities, etc. This description is better than that of Ptolemy or that of Marinus of Tyre and all the others" (142 and 101 1794—95).

Let us briefly examine this description by al-Mas'udi. He speaks of mainland in the singular, because in his time the Arab world believed in the spherical shape of the earth and in its division into four mainland groups: two in the northern hemisphere and two in the southern hemisphere. The inhabitants of the Mediterranean world could only know one of these, namely the one on which they lived, which included Europe, Asia and Africa, the whole of which is surrounded by the ocean. This is essentially the same idea as that of Macrobius, where Asia included the dragon's tail, that is, South America.

Al-Mas'idi speaks of "the sea," because for him there is only one sea that surrounds each of the four parts of the earth, and in particular the one on which the known peoples live. This idea has no connection with the wheel maps of the Christian Middle Ages, in which the earth was also surrounded by a single sea, because for the West it was not a question of a quarter of the earth, but of the whole earth, which was usually imagined as a flat disk and not as a sphere.

“The deserts,” says al-Mas'üdi, because these deserts play an important role in the life of the Arab peoples as a connecting route between the inhabited places.

The superiority of Rasm over Ptolemy leads Lelewel to believe that al-Hwärizmi "has forever brought down the immense monument of Ptolemy." To what extent did al-Hwärizmi improve the map of South America, of which Ptolemy knew only the northern part of the Pacific coast?

X.3. The reconstruction by Hubert Daunicht

Only one copy of the Kitab Surat al-ard, al-Hwärizmi's main work, is known today, and is kept in the University Library of Strasbourg under the signature L. arab. Cod. Spitta 18. Spitta published a short description (195) after he had acquired the manuscript in Cairo in 1878. The Alsatian University bought the manuscript from his estate.

contains 45 leaves, probably copied in 1037 from a text that does not seem to have been very clear.

The full title in German translation is: Book of the survey of the earth, its cities, mountains, seas, all its islands and rivers, written by Abu Djafar Mobammed ben Musa the Kbarismian, after the treatise on geography compiled by Ptolemy the Claudius.

The note of the Claudians shows that the Alexandrian geographer, after the According to al-Hwärizmi and his contemporaries, he was a descendant of the Roman ian Emperor Claudius.

The book begins without an introduction by listing the geographical location data (longitude and latitude) in the order of the "climates", ie in strips of geographical latitude and within each "climate" in the order of geographical longitude. This practical method has the great advantage of making it possible to derive numerous longitude and latitude data that are difficult to read from places in the manuscript that are in poor condition.

Rasm al-ard or rasm al rub al mamur is used as a title only by Abu al-Fiddab or Abul-Feda (1273—1331), five centuries after al-Hwarizmi. In the 10th century, al-Mas'udi and al-Battani gave this work the title Kitab surat al-ard, as it is in the Strasbourg manuscript.

The mention of very different colours in mountains to illustrate the
To facilitate the clarification of travel reports is proof that this handbook

originally featured a geographical map. Now it contains

The Strasbourg Codex no longer contains a world map. Fortunately,

the list of coordinates the reconstruction of the lost map.

Hubert Daunicht has taken on this task, at least for the eastern part, which is precisely the part of interest to us (32). (Fig. 42).

Daunicht takes the longitude and latitude information of places on the coast from the manuscript and deduces or estimates the hard-to-read coordinates. He enters these coordinates on graph paper and connects the points thus obtained with straight lines. In this way he obtains an approximate reproduction of the coastlines of the lost map. He tries to do the same for the towns, rivers and mountains.

A comparison of this reconstructed map with that of Ptolemy and that of Hammer places al-Hwarizmi in an intermediate position, not only in terms of time but also in terms of the quality of the information.

Many place names are common to all three maps. To create a comparative overview, I also add the Nuremberg potato, which was drawn according to Hammer or his unknown source. I include all the important places from Taprobana to the east and the credible points of interest in the dragon's tail.

The following documents form the basis for this comparative overview:

1. Ptolemy: The map of India Transgangetica, designed by Louis Renou from the Greek manuscript Venetus 516 (173).

2. al-Hwarizmi: the map reconstructed by Daunicht (32).

3. Hammer: The Ptolemy map in the Insularium Illustratum Henrici Martelli Germani of the British Museum, Add. Ms. 15760 Fol. 68 v9—69r" (84).

4. Bebaim: The photographs published in the Ibero-American Archives in 1943 (107) and the reproduction in segments from the possession of the Geographical Service of the Spanish Army.

The following overview results:

1. PTOLEMAIOS 2. AL-HWARIZMI 3. HAMMER 4. BEHAIM
approx. 170 833 1489 1492
Taprobana Tabrubani Taprobana Taprobana
Sinus Bahr al-Hind Sinus Golf without
Gangeticus (Indian Sea) Gangeticus Name
Aurea Peninsula without Aureus Aurea
Chersonesos Name Chersonesos Chersonesos
Magnus Sinus Bahr al-Sin Sinus Magnus Golf without
(China Sea) Name
Aspithra Asfitra Aspicaris Aspiotra
Notium Cap 1156 Cap without Cap without
Promontorium Name Name
Satyrorum Cap 1155 Cap without Cap without
Promontorium Name Name

1. PTOLEMAIOS 2. AL-HWARIZMI 3. HAMMER 4. BEHAIM

approx. 170 833 1489 1492

Saenus Fl. Sawanus Senus Fl. illegible
(shifted
southeast)

Cutiaris Fl. Quttiyarus River without Cotara

Surname

Cattigara Qattigura Catigara illegible

not available Bahr al-Muzlim Oceanus Occeanus (Sea of Indicus
Orientalis and Darkness) Orientalis! 5 Occeanus
Indie

Superioris

Most of the place names on al-Hwarizmi's map agree with those of Ptolemy, Hammer and Behaim. The general course of the coast between Taprobana and Kattigara is the same. The Atlantic coast of the Dragon's Tail, which does not yet exist in Ptolemy, is already present in al-Hwarizmi, but still completely without details; in contrast, it is clearly and accurately reproduced in Hammer and rather poorly copied in Behaim.

The only notable difference is that in Ptolemy the South American coast south of Kattigara turns west to join the African coast, while in the other three maps it turns east and later northeast and north, forming the great peninsula of the Dragon's Tail.

This peninsula is on al-Hwarizmi's map, as Daunicht's reconstruction proves beyond any doubt. By identifying rivers and mountains on Hammer's map, I have proved that this peninsula is South America. It is also on al-Hwarizmi's map.

X.4. The Atlantic, the Strait of Magellan and Tierra del Fuego

On Behaim's globe, the ocean east of the Dragon's Tail, or South America, is the Atlantic, which extends far east to Africa.

In Hammer's case, this ocean is cut off from the frame of the map. One part is in the far west opposite the coasts of Africa and Europe, the other in the far east opposite the coast of South America.

In al-Hwarizmi, the Atlantic Ocean is located at the two opposite ends of the map for the same reason. It is called Babr al-Muzlim or Sea of Darkness, the same name given to it by Saint Isidore

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15 This designation is missing on Hammer’s Ptolemy map in London, but is on the Yale University copy.

in his De Insulis in the 7th century, al-Idrisi in his Kitab rugar in the 12th century.
Century and most geographers, philosophers and other scholars of the Middle Ages, whether Muslim or Christian.

Al-Hwärizmi is therefore the author of the oldest map known today, which shows South America with its two coasts, the Pacific and the Atlantic.

However, there is a notable difference between the map as-

Hwärizmis on one side and the cards of Hammer and his descendants ahmern on the other side: the south of the dragon's tail.

I had established that Hammer only knew the two entrances to the Strait of Magellan and therefore replaced them with a land bridge. Now al-Hwärizmi shows a square strait and a large island in the same place. Are these the Strait of Magellan and Tierra del Fuego?

Was al-Hwärizmi better informed than Hammer? Was Tierra del Fuego better known in Baghdad in 833 than in Florence in 1489?

Before answering this question, it is necessary to discuss some parts of the Arabic map that may not seem entirely clear at first glance.

The island lying south of the Dragon's Tail, separated from it by an angular strait, is called Gazirat al-Fidda, Silver Island, and its name immediately brings to mind Ptolemy's island Jabadiu, the Millet Island, whose capital was Argyre or Argentea (113). Some geographers have identified Jabadiu with Sumatra (95), others with Java (88 1 408). Daunicht was at first a supporter of the second view, then he doubted it and considered, without great conviction, an identification with Formosa (32 488-89).

In Ptolemy's case, Labadiu lies on the high seas, far from the coast, while Gazirat al-Fidda is separated from the Dragon's Tail only by a long strait.

Ptolemy knew of only one silver island, while al-Hwarizmi knew of two. This creates a confusion that persists even on Hammer's Yale Ptolemy map (not on the London map) and on the later maps by Behaim, Waldseemiiller and others. These two islands only partly have the same name. Southwest of the southern tip of South America is Gazirat al-Fidda and further east is Gazirat al-Fidda al Babr al-Muzlim, which means "Silver Island" and "Silver Island in the Sea of Darkness".

Similarly, Hammer-Yale, Behaim and others depict two islands east of the tip of the dragon's tail, called Lava Minor and Lava Maior respectively. As in al-Hwärizmi, the more easterly of the two is larger.

On the Arabic map, this is a matter of the relocation of a place name to the place where Hammer-Yale, Behaim, Waldseemüller and others have relocated a whole series of islands.

With or without this error in place names, al-Hwärizmi's map clearly shows that the south of the Dragon's Tail lies in a winding strait and a

large island ends like South America in the Strait of Magellan and Tierra del Fuego. There is no reason to believe that a mysterious coincidence guided the cartographer's imagination when he drew a strait and an island exactly there.

te, where there is actually a strait and an island and more precisely, an angular strait and a large island.

Hammer must therefore concede the claim of being the first known cartographer to depict Tierra del Fuego to al-Hwärizmi. However, it must be admitted that Hammer's map is more complete and the course of the South American coasts is more accurately depicted.

Did Hammer know al-Hwarizmi’s work?

Almost certainly not, because the geographers of the Christian Middle Ages were not aware of the works of their Arab colleagues, with the exception of a few who worked in the West, such as al-Idrisi. The translators of Toledo in the 12th and 13th centuries did not translate the works of al-Hwärizmi or al-Mas'üdi into Spanish. Hammer must have had other precise and important sources at his disposal in order to give his map the correct outlines of South America and, above all, to correctly depict the network of waterways in the interior.

And if Hammer had known al-Hwarizmi's work, he would certainly have benefited from the Arab's only advantage over the German from Florence: his knowledge of the Patagonian Strait.

X.5. Kattigara near al-Hwarizmi

While the city of Kattigara is shown on the coast on all maps I have discussed so far, in Ptolemy, al-Idrisi 1192 (146), Hammer 1489, Contarini 1506, Waldsee-müller 1507, etc., Daunicht relocates it inland to the bank of a river in his reconstruction.

This situation is all the more unusual because, according to Toma-schek (201), the word Kattigara comes from Sanskrit, where Kaccbya-Gada means coastal fortress.

I have been able to convince myself that the reconstruction of Dau-nicht, which makes Qattigura an inland city, is based on a false reading.

Daunicht and Nallino have read the same Strasbourg manuscript, the only one known. Nallino assures us that the parchment is badly damaged where the longitude of Qattighora is recorded. It is so badly damaged that the two Arabists could not agree on the reading of the figures.

To Nallino (152) To Daunicht (32)
Qattighora 161° 30' Qattighora 164^30'
Asfithra 164 15' Asfitra 160 15

I recall that Daunicht drew the coast line by drawing the

Points whose coordinates al-Hwarizmi gives, connected by straight lines.

Qattigura would be on the coast if its geographical longitude were 162^30'. I am absolutely convinced that Daunicht's reading is an error caused by the poor preservation of the manuscript and that Qattigura must be shown on the coast on the map of al-Hwarizmi, as on the other maps.

XI. Ptolemy and the Great Gulf

XI.1. The reduction of the Megas Kolpos

On the one hand, I have established that in 1489 Heinrich Hammer drew a world map inspired by Ptolemy, to which, thanks to mysterious but correct information, he had added the east, the south and the interior of South America.

On the other hand, I have found that al-Hwarizmi 833 also had information that enabled him to improve Ptolemy's map and add to it the east and south of South America, but in a less detailed and less accurate representation of the coastline and the river network than Hammer.

Since Ptolemy's Geograpbiké Hypbegesis was the common source of both cartographers, it is only natural to examine the work of this scholar more closely.

Claudius Ptolemy of Alexandria was probably born around 100 AD.
He was born in Ptolemy Hermia in Upper Egypt in 144 BC and died in Canopus around 178 AD. He spent most of his life in Alexandria in Egypt, where he held a prominent place in the scientific world as a mathematician, astronomer and geographer.

Of his many works, only Geograpbiké Hypbége-sis or Introduction to the Drawing of a Map of the Oikumene or Introduction to the Cartography of the Earth is of interest here. In ancient times, the word "geography" meant the measurement of latitude and longitude and their recording on the map. It is what we call cartography today, but on a global scale.

Ptolemy claims to have presented in his cartographic work a critique, correction and updated version of the work of

Marinos of Tyre.

Meanwhile, as Bunbury has written, "it is evident that Ptolemy has not received any new geographical information, and that the changes he introduces into the work of Marinus of Tyre are merely arbitrary" (21 II 535-36). This view is shared by Ballesteros y Beretta, who adds that "Ptolemy has incorporated a great number of errors in his tables" (12 HI 115), which also corresponds to the ideas of Wurm (213).

The Geograpbiké Hypbégesis consists of eight books and adopts the plan of the work of Marinos, which it criticizes. The first book contains general information on the sources and the principles for producing a world map. The following books are long tables of longitude and latitude data for all cities and other important points on earth; as a zero-merit

dian, in the far west, he took that of the Islands of the Blessed, that is, the Canaries. Several historians of cartography have objected to the formerly widespread view that Ptolemy's geography was entirely the work of the Alexander.

Paul Schnabel has shown that in Book VII of Geography, Chapter 29 cannot be attributed to Ptolemy (188 II 61ff.). Erich Polaschek devoted an investigation to the comparison of the Greek manuscripts of the Geographike Hypbegesis and the development of this work over the centuries in the Greek and Byzantine world up to the time of its translation by Chrysoloras and Angelo de Scarparia (167 17—37). Polaschek proved that in Book VII mentioned above, none of the chapters following Chapter 28 can be attributed to Ptolemy; he classified the Greek manuscripts and examined their differences in order to establish an order of age and reliability with respect to the original text.

The oldest known Greek manuscript dates from the 13th century and comes from the Vatopedi monastery on Mount Athos in Greece. One of the best preserved is the Codex Vaticanus Vin-dobonensis Parisini, probably copied in 1401.

The question of whether Ptolemy drew the corresponding maps when he wrote his book has long been disputed. This point does not have the importance that has been attributed to it, and it is now generally assumed that the maps bound to some manuscripts of the Hypbégesis are the work of Agathodaimon (literally translated: the good spirit or the good devil), of whom we do not even know whether he was a contemporary and collaborator of Ptolemy or whether he lived in the following century.

On Ptolemy's map, India Meridionalis, ie South America, is shown only with its Pacific coast (Fig. 43), from 17' N. (Central America) to the south. At 8'30' S. is Kattigara, at least on the maps called "from the third edition". From there the coast continues southwards, like the Chilean coast from Arica in reality, then it turns westwards to join the African coast, which shows that Ptolemy did not believe that the Phoenicians were in the service of Pharaoh Necho II.

They had circumnavigated Africa, as Herodotus of Halicarnassus reported, although without believing it themselves (89 IV 42).

The Indian and Pacific Oceans together form a single closed sea, and the countries bordering it to the south form the Antarctic continent, without borders, outside the frame. Although he believed in the spherical shape of the earth, Ptolemy had the earth end at 14, 20 or 24 s. Br., depending on the edition, because he believed that the oecumene could not extend over more than 90 degrees of latitude, because it would be "impossible to live with one's head downwards".

This denial of the antipodes was common throughout the Middle Ages (12 III 126). Its most important advocate was Lactantius, called "the Christian Cicero", the tutor of Crispius, the son of Constantine the Great. Lactantius taught that "lack of knowledge of geography is a merit and is pleasing to God" and added: "Aut est quisquam tam ineptus qui credat esse homines quorum vestigia sint superiora quam capita?", in English: "Is there anyone left so stupid as to believe that there are people whose feet are higher than their heads?" (125, VII)

St. Augustine shared this view. He claimed (8): ‘People on the other side of the earth ask for a calcareous garment and there is no credibility in it’.
(In no case should one believe that men from opposite parts of the earth make opposite tracks with their feet.)
Even after Christopher Columbus's first voyage, a supporter of this idea can be found in Zacharias Lilius, the author of the Orbis Breviarium, Florence 1493 (133).

As for the degrees of longitude, Ptolemy does not pretend to show the whole northern hemisphere. On the contrary, he limits it to 180 degrees, because the impossibility of living on the antipodes also implies the impossibility of connecting the oikumene in which Ptolemy lives with the other parts of the earth where probably no one lives. In reality, Ptolemy does not examine the problem of the antipodes, because he considers it solved by saying that it is ridiculous to suppose that certain peoples hang with their heads downwards, and consequently he limits the inhabited world to 180 degrees of longitude.

For me, who has followed the development of the representation of the Pacific Ocean since Sanuto's map of 1574 and found it referred to as Sinus Magnus on Ortelius' map of the same year, it is very

‘It is easy to recognize this ocean in Ptolemy’s Megas Kolpos.

The Megas Kolpos has been called Sinus Magnus since the translation of the Geograpbiké Hypbégesis by Chrysoloras from Greek into Latin and its dissemination by Jaco-po d' Angelo in 1410 (Fig. 44, 45).

Sinus Magnus has the same meaning as Megas Kolpos: Rough Gulf but a Spanish dictionary from the 19th century gives a free translation which is a very accurate interpretation:

Sinus Magnus = Mar del Sur." which is equivalent to the conclusion that the Sinus Magnus is the Pacific

Ocean (145). This cartographic fact, which some historians of early cartography, sometimes under the caustic mockery of the ignorant, try to

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!6 Southern Ocean, old name for the Pacific Ocean, which lies to the south as seen from the Isthmus of Panama; the term lives on in our country as “South Seas”.

to make it known again (106 and 66—70), was forgotten by cartographers after the end of the 16th century, but survived among humanists until the end of the 19th century.

XI.2. Who was Alexandros?

Since the Sinus Magnus is the Pacific Ocean, Ptolemy's map includes the entire Peruvian and part of the Chilean coast.

As I have already observed in my examination of the Arabic map, one finds there two characteristic capes of the coast of Ecuador and Peru: the Satyrorum Promontorium or Cape of the Satyrs, which is to be identified with Punta Aguja, and the Notium Promontorium or South Cape, which is Punta Parina, as Ibarra Grasso has shown (106 41—42).
|

Regarding the Pacific Ocean, it is interesting to consider Ptolemy’s criticism of Marinus of Tyre:

"Marinos does not specify the number of stadia of the crossing from the Golden Chersonese to Kattigara. He does, however, say that Alexandros's records state that from there the land lies 'opposite' the south and that sailing along it, one can reach the city of Zabai in 20 days, but that from Zabai, sailing 'a number' of days southwards, and more to the 'left', one can reach Kattigara.

reach.” (170 I 14,1)

"He now extends the distance in question unduly by trying to extract the meaning "many days" from the expression "a number of days".
For he says that the days were not numerically determined because of their number. This seems to me reasonable.
For what number of days can be indeterminate, even if it included the voyage over the whole of the world? And what could have prevented Alexandros from saying "many" instead of "a number"? Marinus has said of Dioscorus that he reported that the voyage from Rhapta to Prason took many days. With more reason one might understand the expression "a number of days" as "a few days," for we are accustomed to express ourselves in this way.'* (170 I 14,2).

"The section from the Golden Chersonese to Zabai must not be shortened in any way, since it runs parallel to the equator, because the land between the two points extends 'opposite' the south. But the section from Zabai to Kattigara must be shortened - since the sea voyage runs towards the south and the east - in order to obtain the length of the corresponding section parallel to the equator" (170 I 14,5).

It is thus found that the only information on which the maps of the Far East by Ptolemy and Marinus of Tyre were based is a small, highly controversial fragment of a sentence by a famously unknown Mr. Alexandros, which states nothing more and nothing less than that one travels from Zabai to Kattigara by ship “a number of days.”

An eminent historian of Greek cartography has written about Alexandros that nothing is known except that he is the source for Marinos of Tyre" (151 46). This lack of information has not prevented experts from speculating about the person of Alexandros and from convincing themselves of the results of their own deliberations. Some assert that Marinos knew Alexandros personally and was able to question him at his leisure about his journey to Kattigara. Others claim that Alexandros was a Greek merchant living in a port on the Red Sea (21 II 535 and 88 I 407) and still others make him out to be a sea captain whose logbook was inspected by Marinos of Tyre (95 63), who, moreover, commissioned him to compile all useful information about distant countries before his departure for the Far East (95 89). There are even some who imagine Alexandros as an educated tourist who wrote a travelogue.

Each of these modern authors contributes ideas which are possible but lacking in evidence. We are here entirely in the realm of prehistory, where we try to work out reasonable, possible and consistent hypotheses, without being able to say anything more.

It is possible that the expression a number of days came from Alexandros himself, but even that is not certain. Possibly it came from some one who passed on his story. It was Marinus of Tyros who gave this expression the meaning of many days, and Claudius blames Ptolemy for it. Marinus was undoubtedly more correct in his interpretation of Alexandros than Ptolemy, for it is possible that Marinus personally questioned the mysterious traveler, or that he had one of his written reports. On the other hand, it is certain that Ptolemy did not know Alexandros.

., who must have been long dead by the time the Alexandrian wrote, and it is almost certain that Ptolemy did not see any report from Alexandros either, for he always refers only to Marinos of Tyros. It seems to me still possible and very probable that Alexandros' report was only given orally and nothing says whether it was given directly to Marinos or whether he received it in the circles of the port of Tyros, the main source of information for the cartographer. Whatever the case, Marinos is more competent here than Ptolemy when it comes to judging Alexandros' statements.

Before I leave this personality, I would like to point out that Polaschek believes that this Alexandros is Polyhistor, who lived from 80 to 35 BC and provided the Roman world with a lot of information about the Far East (167 35). (Polyhistor is just a Greek nickname that means "know-it-all"!). If this is the case, Marinus of Tyros could not have known Alexandros either and could only have known what he was told about it.

The conclusion from this study is that Ptolemy had a preconceived idea of the earth based on the impossibility of living with one's head downwards and, consequently, on the impossibility of the inhabited world, which coincides with the world that can be known and explored, extending over more than 180 leagues. Before writing the geography, Ptolemy put on blinders and rejected the information that contradicted his basic principle.

Ptolemy's entire geographical work is based on that of Marinus of Tyre. It is clear that Ptolemy did not receive a single new piece of information. He confines himself to copying from Marinus, discussing him, contradicting him and trying to ridicule his conclusions, according to which the inhabited earth is more than half the size of the globe, or more correctly, more than a quarter, since Ptolemy limits his oikumene to 180 degrees of length but only 90 degrees of latitude, without explaining the difference in the criteria for the two coordinates.

Ptolemy himself admits his strange way of acting: "To calculate the total dimensions, we have now, for the reasons just explained, reduced the eastern part of the longitude (to 180^) and the southern part of the latitude (to 90^) to the dimensions mentioned." (170 I 15 1)

Ptolemy's conviction is perfectly clear. This voluntary error, this deliberate mistake of the geographer from Alexandria, has prevailed for centuries for two reasons: the cultural regression after Marinus of Tyros was long and significant, and the work of Marinus is lost, while

while that of Ptolemy was handed down, both in the Arab world and in the Eastern Roman Empire, and reached the West in the 15th century.

By trying to improve Marinos' work, he only made it worse.
Nevertheless, posterity has honored Ptolemy more than Marinos and still honors him.

XII. Marinos of Tyre and the reconstruction of his map

XII.1. Marinus of Tyre and his ideas

The only certainty about the biography of Marino of Tyre is that almost nothing is known. Only two authors mention him: Claudius Ptolemy in his Geograpbiké Hypbégesis and al-Mas'üdi in his Kitab al tanbih wal Graf: the first to criticize and copy him, the second to praise him and... not to follow him.

Al-Mas'udi assumes that Marinos lived at the time of Nero (142), that is, between 34 and 68 AD. Most historians of cartography, however, date his life to the "end of the 1st century AD" or "around 100 AD."

In a very detailed study of the work of the Tyrian, Albert Herrmann estimates that the most important part of his scientific material was collected after the Dacian War, the conquest of what is now Romania by the Emperor Trajan in 107 AD, and before the Parthian War, the conquest of what is now Iran, also by Trajan in 114 AD (92 45). The successive versions of his work, generally called "editions", would therefore have been written approximately between 114 and 130. He has detailed information on land travel on the Silk Road to China. This allows us to assume that he lived for some time in the city of Tyre, the starting point of this route and an international trade center, and that his nickname "of Tyre" does not necessarily refer to his place of birth. On the other hand, his good knowledge of Africa and India suggests that he lived in Alexandria in Egypt, the cultural capital of the time, where his scientific work would have had the best opportunities to radiate into the educated world.

These are not statements that can be proved, but simple conclusions without proof. Because he was called "of Tyre," many have thought that he was a Phoenician. Others classify him as a Greek, for the simple reason that he was a scholar. A compromise solution was that he was born in the Greek colony of Tyre. If it is true that he lived for many years in Alexandria, there must have been so many people there with the name Marinus that it was necessary for him to adopt the nickname "of Tyre" to avoid confusion, without this saying anything about whether he was born in the Phoenician city or whether he lived there before his stay in Alexandria. In any case, these are conjectures.

All the works of Marinus of Tyre have been lost, and there is only one that is known from references: Diordosis tu Geographiku Pinakos, which Ptolemy copied and criticized in 15 of its chapters. There were numerous editions. His theoretical foundations are based on Eratosthenes, Hipparchus and especially Poseidonius.

The title literally translates as: Correction of the geographical table,
Correction of the map of the oikumene or correction of the world map, the German

It is assumed that the author claimed to correct and improve one or more works of earlier geographers. It seems that the Tyrian's intention was to modify the work of Poseidonius by drawing on the astronomy of Hipparchus and various recent travel reports.

Eratosthenes and Poseidonius thought that on the spherical surface of the earth there must exist several oecumenes, several inhabited worlds, separated by the impassable oceans and by a scorching and uninhabitable strip along the equator. Their "world maps" claimed to include only the oecumene in which they themselves lived, for it was considered impossible to obtain knowledge of the other inhabited worlds of the earth.

Marinus of Tyre, on the other hand, took the liberty of giving his oikumene (Fig. 46) a total area of 22 5^ and extended it to 24? s. Br., which left no room on earth for other oikumenes of the same size (95 57).

For Marinos' predecessors, the oikumene was completely surrounded by water. Marinos, on the other hand, gave it an oceanic border only in the west. In the east, his world ends in a country called Tbina, origin of the word Cbina.

Where did Marinos imagine the eastern end of this country of Thina to be? East of the border, without doubt; but at what distance? In the absence of facts to support this, it may be assumed that the capital, also called Thina, is in the middle of the country. Since Marinos places this city 45° east of the western border of China, it can be deduced that the country may also extend 45° east of the capital. This gives an inhabited world of 270° longitude, from the initial meridian that passes through the islands of the Blessed, the Canaries. This very reasonable hypothesis leaves only a distance of 90 degrees of longitude between these islands and the east coast of China, which represents a mean between the geographical ideas of Martin Behaim and Christopher Columbus.

Poseidonius, who lived between 135 and 50 BC, left behind a considerable body of work, mainly in terms of quality and volume a world map and a geographical book entitled “On the Ocean” (169), which deals with the problem of the world ocean, as well as the general structure of the earth's surface (15 593ff.).

Marinus adopted the measurement of the earth proposed by Poseidonius. While Strabo, who lived from 58 BC to 24 AD, was a supporter of Eratosthenes' measurement of 252,000 stadia for the circumference of the earth, that is, 700 stadia per degree, Marinus adopted from Poseidonius the circumference of 180,000 stadia, with 500 stadia per degree (12 III 115).

The question why Marinus of Tyros and with him Ptolemy adopted the measurements of Poseidonius and not those of Eratosthenes was raised.

This was discussed extensively at the beginning of our century between Hermann Wagner (206 1 54) and Hans von Mÿik (150 24ff.). I will not go into it here, as it only touches on the subject in passing.

The map of Poseidonios, drawn around 60 BC, has been handed down to us by Dionysius the Periegetes. The earth forms a single continent, bordered to the southeast by the Erythraean Sea (the Indian Ocean) with the island of Taprobana (Ceylon), to the east by the island of Chryse (the Golden), which is interpreted as Malacca or Sumatra, and to the north by the Mare Scythium or the Arctic Ocean. There is no trace of the dragon's tail on this map.

XII.2. The Southeast of Marinos Map

For Southeast Asia, Marinos has the Periplus Maris Erytbraei, i.e.
Shipping guide for the Indian Ocean (189 V—1) was used, as was the route description of the emissaries of the Macedonian merchant Maes Titianos (170 111,6) of the route of the trading caravans that fetched silk from beyond Bactria, in East Turkestan, in the west of present-day China (95 90ff.).

A good authority on ancient geography, EH Bunbury, wrote: "The Peri-plus of the Erythraean Sea east of Cape Comorin (the southern tip of India) is strange and interesting, if only because it proves that the ancient navigators visited the coasts beyond the Bay of Bengal, and that they knew of much more distant countries in South-East Asia than their predecessors. It is certain that the statements, which are as definite as those of Marinus, are based on real events, although we shall find it difficult to interpret them. To attempt to reconcile them with the present geography of these countries, and to identify the cities mentioned, is a task without prospect of success" (21 II 535-536).

A century has passed since Bunbury wrote these pessimistic lines. Since then, early cartography has been trying to identify the places listed by Marinos. The task is tedious, but it is of obvious importance.

marked by visible progress.

XIL3. Did Marinos of Tyros draw maps?

The work of Marinus of Tyre, which Ptolemy made the basis of his treatise, does not seem to have contained a map. It contains only general instructions for drawing a world map and tables of geographical coordinates. These tables consisted, as I said in the case of Ptolemy and al-Hwarizmi, of long lists of cities and other important places with their latitudes and longitudes, so that the reader, if he so wished, could plot these points on a grid. Anyone could thus do his own thing.

design your own map by connecting the points obtained with straight or curved lines, depending on your taste or imagination.

While Honigmann (101 XIV 1767ff.) and some others believe that Marinos of Tyre did not draw a map, Hugo Berger (15 582ff.) and Albert Herrmann (95 55) are convinced of the opposite. In any case, Ptolemy, who comments extensively on Marinos's views, never mentions maps.

On the other hand, al-Mas'udi claims to have seen maps by Marinus of Tyre. Since he is a geographer of the tenth century, it is assumed that he saw maps drawn from Marinus' tables. This assumption actually increases the problem, since at present only Ptolemy is known to have had the Tyrians' work at his disposal, and it is not even possible to guess who could have used it as a basis for making maps. Other authors (101) believe that al-Mas'udi saw maps of Ptolemy's Geograpbiké Hypbégesis, which means that the Arab saw in Marinus the true author of the essential and correct part of the treatise, of which the Alexandrian was the "improviser."

Incidentally, this also corresponds to my opinion about the two geographers.

Marinos gives between 7000 and 8000 pairs of coordinates. It is undoubtedly impossible to include so many place names and positions on a map.
Albert Herrmann (91 780 ff.) imagined that Marinos had made partial maps. This idea was rejected by Honigmann (101) and Kubitschek (123 2100 ff.), who are convinced that Ptolemy only had Marinos' tables at his disposal.

On the very scant basis of allusions and criticisms of the Tyrian map by the Alexandrian, a modern expert on ancient cartography (95 68 ff.) has reconstructed three successive versions of Marinus' map. The oldest leaves the Indian Ocean open in the south, which represents an intermediate position between the ideas of Poseidonius and that of Ptolemy. The Alexandrian would have copied the third map type of the Tyrian with the closed ocean.

The question of Marinus's estimates of distance was taken by Ptolemy as an opportunity to reduce the extent of Tyrian's map. The Alexandrian says that "he shares Marinus's distrust of travellers' information" and that Tyrian thought that "merchants, having devoted all their attention to their trade, pay little attention to the routes they travel and that, on the other hand, they have the habit of exaggerating distances by boasting" (170 1 11,7 and 95 96).

Although he knows Marinus' caution, Ptolemy takes the liberty of reducing the distances again and trimming the world according to his own tastes and prejudices, mainly according to his ideas about the impossibility of living on the antipodes.

For these reasons the Alexandrian shortens the total length of the oikumene to 180°; he omits 45° compared to the map of Marinos and explains this explicitly. What he does not say is how and in which part of the world he accomplishes this shortening.

XII.4. The reconstruction of the map

Modern geographers who have attempted to reconstruct Marinos' map have followed the reverse procedure to that used by Ptolemy.

In the 18th century, Gosselin assumed that the Alexandrian had shortened the map of Tyre in its entire length (76), and consequently reduced that of Ptolemy to the length. However, he preferred the Megas Kolpos, to which he gave an extension of 24? long, which is an increase of 200%, compared with 25? 96 on the whole map.

In the 20th century it is believed that the shortening by Ptolemy only extended to the far eastern part of the map of Marinos, east of the meridian 125? 6. L., that is, east of Cape Kory or the southern tip of Taprobana. The shortened part, which must be lengthened again for the reconstruction of Marinos' map, is therefore that which contains the two gulfs: the Gangetikos Kolpos or Bay of Bengal and the Megas Kolpos or Pacific Ocean.

In his reconstruction Honigmann only lengthens this part of the map, giving the Megas Kolpos a length of 32° (101). On the other hand, Ibarra Grasso claims that since in Ptolemy's map the Megas Kolpos, i.e. the Great Gulf, is much smaller than its close neighbour, the Gangetikos Kolpos, it is necessary to grant the former at least the same length as the latter. He adds that the shortening by Ptolemy only came at the expense of the Megas Kolpos, which on the map by Marinos is at least 57°, but probably 70°.

length (106 52-54 and 181—183).

Ptolemy has literally amputated the world view. If we were to follow his statements, something improbable would emerge. In that case, Marinos would have simply limited himself to adding up the distances that Alexandros, his only mysterious and difficult to understand informant, supposedly traveled and for this reason added 45 superfluous degrees of longitude.

The exact opposite has happened, since Marinos, out of prudence, reduced the distances given to him by his informant, so that he obtained a greatly reduced Pacific Ocean. The reverse error which the Alexandrian accuses the Tyrian of is only a poor pretext for defending his own erroneous hypothesis.

It is obvious that Marinos does not have precise information about the route from Zabai to Kattigara, ie the crossing of the Pacific, and that his informant Alexandros only says, "one comes to Kattigara." The text of the Ptolemaios, the only one we have, does not even say whether Alexandros even reached Kattigara, for he could have received his information from other persons in some Far Eastern port.

From Zabai, which Ibarra Grasso has identified with Sabah on the island of Borneo (106), the route runs south and southeast to reach the great South Pacific ring current. According to Paul Herrmann (96), this current reaches the Chilean coast at 40° S. latitude, that is, south of Valdivia, and from there follows the coast northwards under the name of Humboldt Current.

The great coastal arc which borders the Megas Kolpos to the north is therefore pure speculation on the part of Marinos, that is to say, conjectured, invented due to a lack of information from this area. It is therefore irrelevant whether one draws it at 20°, 30° or 40° N., for it is a coast of whose non-existence Alexander and Marinos of Tyre knew nothing.

On 16th century maps, this coast slowly shifts northward as the coast of China was discovered west of the Sinus Magnus and that of Mexico and California east of it.

To reconstruct the south-eastern part of the Marinos map, I take the liberty of making use of Honigmann's excellent reconstruction of the whole map (101 and 163). I assume that three quarters of this reconstruction are drawn correctly: the northern half and the western half.

I would like to recreate the fourth quarter, the south-eastern one, from Cape Kory and Taprobana, where the lands and seas unknown to Ptolemy begin, the lands and seas for which the Alexandrian had no other source than the text of Marinus.

Ptolemy could not take the liberty of "cutting off space" in the western half of the world map, because these were areas known to the sailors of the Hellenistic-Egyptian world and regularly visited by them. While the south-eastern quarter of the Gangetikos Kolpos was known only through vague information from the Periplus Maris Erytbraei and the Megas Kolpos only through even more vague information from Alexandros and Marinos. Only there, therefore, could Ptolemy "cut down" the world without provoking too strong protest.

I consider it certain that the longitudes between the Isles of the Blessed and Taprobana, fixed by the Alexandrian at 123" ó. L., have generally been maintained. The actual distance from Ceylon to Singapore is only 23°. As there is no reason to suppose that Marinos would have crossed this distance, I place the point of the Golden Chersonese on my reconstruction at 146° 6. L.

From there to the end of the map at 225° 6. L. I have 79* left, which are completely occupied by the Pacific Ocean, which gives it its name Megas Kolpos

or Grofter Golf compared to Gangetikos Kolpos, which now only has 23? length or more than justifies any other golf course in the world.

On this basis, I improved Honigmann’s reconstruction and obtained the result shown here (Fig. 47).

There is no doubt that the real extent of the Pacific is much greater. But I have shown from Ptolemy's own words that Marinus of Tyre was suspicious of the statements of sea captains, who always tried to increase the distances covered in order to be able to boast of particularly long voyages. It is therefore quite natural that Marinus reduced the distances given by Alexandros, assuming that he gave exact figures. It is also possible that Alexandros was neither a captain, nor a merchant, nor a traveller, but merely an educated man from Tyre who heard sailors tell of their voyages and passed this report on to Marinus, but reduced the figures so as not to be considered an ancient "Munchausen" or, on the contrary, a man who could be "pulled a fool".

These considerations, applied to my reconstruction, enable me to estimate the size of the Megas Kolpos reported by the source of Marinos. If the latter reduced the gulf to 79?, his informant must have given him about twice this value, that is, a length of 160^. This is the absolute and definitive proof of the identification of the Megas Kolpos with the Pacific Ocean.

Despite this excessive caution, Marinos was accused by his critic Ptolemy of having increased the distances. He reduced

Marino's Pacific from 79? to only 8 degrees of longitude, that is, to a tenth of its original, all while retaining its name, now unjustly, Megas Kolpos or the Great Gulf.

I have not yet said anything about the details of the eastern coast of the Megas Kolpos. Knowing the working methods of Ptolemy and his complete lack of his own sources of information on the Pacific and the American coast, it seems obvious to me that Marinos of Tyre, like Ptolemy later, had already marked the Promontorium Notium and the Promontorium Satyrorum; as already said, they were identified by Ibarra Grasso as Punta Parifia and Punta Aguja in northernmost Peru (106).

The same can be said of other features of the American coast, such as the rivers Ambastos, Saenus and Cutiaris, for which Enrique de Gandia, Ibarra Grasso and myself have proposed identifications.

So did the mysterious Alexandros visit this area? Did he get this information in Indonesia from Chinese sailors who had made the voyage to Kattigara? Did Marinos have another source of information for the American coast that Ptolemy did not mention and that Marinos perhaps did not name?

107

to

1.

108

Today's science is not able to answer these questions.

From my examination of Marinos's map I draw the following conclusions: Alexandros is the first informant to provide information from South America, which he may have received from Chinese sailors.

. Alexandros probably estimated the real extent of the Pacific, and

approximately 160°, indicated.

Marinos of Tyre is the earliest cartographer to map a point on the South American

Canadian coast.

Marinos wrongly estimated the extent of

160° reduced to 79°.

Ptolemy made this even worse by reducing the 79? of Marinos to 8°

reduced.

Ptolemy's error persisted until the 16th century.

XIII. The Riddle of Kattigara

XIII. 1. Kattigara in Asia?

The geographical location of Kattigara has been a problem for cartographic historians for a century.

The only real information we have about this place is a line from Ptolemy, which gives three different coordinates depending on the "edition". The third, the most recent, states:

Kattigara, Hormos Sinon 8^30' s. Br. 177° 6. L. (170 VIL 3 3)

In the course of this investigation it has become apparent that the identification of the Megas Kolpos or Sinus Magnus with the Pacific Ocean has been forgotten for centuries. During this period attempts have been made to identify the Great Gulf with several relatively small gulfs in East Asia. Great scholars have developed extensive theoretical structures and often etymological (word derivation) games in numerous oriental languages and have come to very different conclusions.

In such a case it is unavoidable to return to the sources, and here the line from Ptolemy already quoted is the only source.

The majority of researchers have translated Ptolemy's expression Kattigara Hor-mos Sinon as Kattigara, port of China, and even given it the meaning Kattigara, port city in China. So they looked on the map for a large port in China, or at least in a far eastern country that could be confused with China by Ptolemy and Marinus of Tyre.

Here is a list of the answers of modern scientists to the problem

Kattigara, in geographical order from west to east:

1. Cape Comorin, the southern tip of India, was proposed by Francesco Barto-lozzi in 1789 (13).

2. Al-Idrisi, the Moroccan geographer of the Norman King Roger II of Sicily in the 12th century, places Kattigara in the delta of the Ganges (146).

3. RA Skelton, the distinguished Director of the Cartographic Department of the British Museum, relocates Kattigara to the west coast of Malacca (194).

4. The island of Singapore or the city of Jahore Bahru, which lies opposite it, was proposed by Vivien de Saint Martin (204 206), Hugo Berger (15 607ff.) and Antonio Ballesteros y Beretta (12 III 1 15).

5. Albert Herrmann chose the surroundings of Saigon in his last essays and a book (95), as did Jean Baptiste d'Anville (6 604 ff.) and Julius Heinrich Klaproth (115 figs. 6, 7 and 8) before him.

6. The village of Katik in Annam is preferred by Heinrich Hirth (98) and Albert Herrmann in an earlier stage of his research (93).

7. Ferdinand von Richthofen concluded from his research that Katti-

gara in the Gulf of Tonkin near Hanoi (177 and 178).
Hirth comes to the same conclusion in one of his works (99).

8. Lassen (128) and the Dizionario Enciclopedico Italiano (42) both support the canton at 23^ n. Br.

9. The port of Fu-tschou (Fu-zhou) in Fo-kien (Fu-jian) at 26° N. was proposed by Berthelot (16).

10. Another port, that of Hang-tschou-fu (Hang-zhou) in Tsche-kiang (Zhe-jiang) at 30° N. is favoured by Kiepert (114), Gerini (72 and 73), Sig-mund Günther (83), Count Paul Téleki von Szék (198), Richard Hen-nig (88) and George E. Nunn (161).

11. Mercator believed that the east coast of the Sinus Magnus should be directed north instead of south and transferred Kattigara to Kamchatka, at 58° N. (144).

12. Volz searched for Kattigara in northern Borneo (205 31ff.)

13. Pigafetta, the chronicler of Magellan's voyage, claims that Cape Kattigara lies in the Pacific at 25° N. (165).

Most of these thirteen Asian interpretations of the location of Kattigara were defended very forcefully by very reputable experts, who generally regarded their own theses as obviously correct and their evidence as sound. Some even expressed pity for those who hesitated to accept their conclusions.

XIII.2. Kattigara in America

The multitude of these theses is the best proof of their weakness. I believe that all the scholars mentioned have fallen victim to two errors:

1. they did not know that the Sinus Magnus is the Pacific Ocean, 2. they translated Ptolemy badly.

I had noticed that the Alexandrian writes in his VIIth book: Katti-gara Hormos Sinon. The translation of Hormos as port is not correct, nor can it be understood as a port city or trading metropolis, and that is exactly what numerous researchers have done. A Hormos is a statio navium, a place where ships can drop anchor, ie an anchorage, a roadstead. Sinon is not the adjective "Chinese", but the genitive plural "of the Chinese".

Consequently, Hormos Sinon is not a commercial metropolis of China, nor a simple Chinese port, but an anchorage used by Chinese merchant ships. It is certainly not to be found in China, but where Marinos of Tyre and his poor imitator Ptolemy have recorded it, on the east coast of the Megas Kolpos, on the east coast of the Pacific Ocean, on the South American coast.

We have several clues to try to locate this much discussed anchorage on the South American coast. The weakest clue

The point of reference is the latitude of Kattigara given by Ptolemy, not only because this latitude varies according to the "editions" of the Geograpbiké Hypbegesis, but because Ptolemy modified the latitudes given by Marinus of Tyre for no other reason than his own ideas about the antipodes.

The latitude of Kattigara has been discussed in detail by experts on the various editions of Marinus of Tyre and Ptolemy. According to Schnabel (187) and Herrmann (95), the Prokeiroi Kanones of Ptolemy, the various editions of Marinus of Tyre and the first two editions of the Geograpbiké Hypbégesis gave a latitude of 8°30' N for Kattigara, while the latest editions placed Kattigara at 8°30' S. In some manuscripts the Chinese anchorage is given as 3° S.

These deviations sometimes reflect the copyists' own ideas or their distraction. But most of the time they are simply a matter of difficulty in reading an old manuscript that they have used as a model.

The confusion for Kattigara is reduced to an "n" instead of a ÿÿ or a "3*" instead of an "8".

Albert Herrmann points out that Ptolemy not only reduced the map in length, but also in width. He therefore increased the southern latitudes in order to reconstruct the map of Marinos. For example, he arrived at 15°30' s. for Kattigara. In another of his works, he suggests 16°25' s.

Br. before (92 51).

If the latitude is increased according to Honigmann's ideas, Kattigara would be located at 18° S. near Arica or, based on other copies of Ptolemy, at 23° S. near Antofagasta or at 30° S. in the area of Coquimbo.

You can also reduce the overall width of the map by

. Marinos, which was 112^30' and was reduced to 90° by Ptolemy (101 1779). If, as is assumed, the reduction was effective only in the southern hemisphere, the Tyrian map must have reached 22 20" further south and thus reached 46° 30' S. According to this interpretation, Kattigara would lie between 36° and 40° S., between Talcahuano and Valdivia.

Another clue is the journey to Kattigara according to the information of the mysterious Alexandros or, in general, the possibility of crossing the Pacific Ocean by sailing ship from west to east.

Paul Herrmann confirms this in his book Seven Passed and Eight Gone (96 242): one may assume with a high degree of probability that ocean-going outrigger boats did indeed reach the west coast of America from time to time.
But these landings probably did not take place in Peru, but much further south, where the cold western current of the Pacific reaches its eastern shore. This takes place in the region of the 40th parallel, roughly between Valdivia and Valparaiso, i.e. far south of Peru."

The totality of these considerations makes it possible to date Kattigara between 8^30' n. Br. and 45° s. Br. to search.

The work of de Gandia (67) has relocated Kattigara to the American Pacific coast. Ibarra Grasso (106) has more precisely proposed Lambayeque and Jacques de Mahieu Chan-Chan (136).

For Ptolemy and Hammer, Kattigara lies south of the mouth of the river Cutiaros and north of the large bay that forms the angle in the coastline.
But according to Marcianus of Heraclea, Kattigara is located in the estuary of this river (140).

XIII.3. Possible location determinations in South America

Before compiling a list of possible localizations for Kattiga-ra, it is necessary to establish the rules that determine or limit this localization, even though these rules are to a large extent mutually exclusive.

a) If the Promontorium Satyrorum of Ptolemy is the Punta Aguja and the angle in the coast at Hammer is Arica, the anchorage of Kattigara lies between these two points, between 6 and 18° S. latitude.

b) If the river Cutiaris of Ptolemy is the Loa and the bay of the angle of the coast of Hammer the Gulf of Ancud, Kattigara would have been located between these two points, between 22 and 42° S. latitude.

c) The distortion grid of Hammer's map places Kattigara south of the 40th southern latitude and north of the Bay of Ancud, i.e. between 40 and 42° south latitude.

d) At Hammer, Kattigara lies opposite the mountains where the sources of the rivers Negro and Chubut are located, i.e. between 38 and 43° south latitude.

e) Prehistory and early history have confirmed the existence of great civilisations that could justify long trading voyages by the Chinese and other peoples, especially on the Peruvian coast, between 5 and 18° south latitude.

f) The most attractive goods for Chinese or Greek trade, such as gold, silver, antimony, etc., were mined in the Peruvian province of Puno, which was perhaps the land of Punt (56), and where the high culture of Tiahuanaco flourished at the time in question. Its port may have been located between 15 and 20° south latitude.

g) The very dubious studies of Barry Fell, based on a communication by Carl Stolp (196), interpret an Egyptian claim according to a rock inscription in Tinguiririca, at 34°45' S., Valparaiso and Concepciön being suitable for maritime traffic in the area.

h) Eduardo Habich has identified depictions of Phoenician ships on steles of the temple of Sechin in the valley of Casma at 9° 30' S. (106).

i) The Chinese annals of the Han Dynasty contain the report of a

Journey to Fu-sang with the drawing of a man milking a llama (56), which could also be a vicuna. Kattigara, the "anchorage of the Chinese", can be located between 5 and 30° south latitude on the Peruvian or Chilean coast.

p The South Pacific Ocean current, known as the West Wind Drift, which allows the crossing ration of the ocean, reaches the coast between 35 and 45? s. Br..

k) The natives of the island of Chiloe, located at 42? s. Br., have the Chinese very similar facial features.

Rather as a statistical oddity than as an argument, I note that four of these rules on the area between 15 and 18? s. Br. and five rules on the Zone between 40 and 42^ s. Br. indicate.

On this basis I count the possible location determinations for Kattigara from south to north. I start with number 14, because this option ten are added to the 13 locations in Asia already listed.

14. Chiloe and the Gulf of Ancud at 42? s. Br..

15. Puerto Montt and the Bay of Reloncavi at 41°30' S.

16. The anchorage of Corral or Niebla at the mouth of the Rio Calle-Calle, downstream of Valdivia, in latitude 39° 50' S.

17. Tolten, at the mouth of the river of the same name, at 39°10' s. latitude.

18. Puerto Saavedra, at the mouth of the Rio Imperial, at 38°45' S.

19. The Gulf of Arauco, at 37° to 37°10' S.

20. The Rio Bio-Bio near Concepción, at 36°50' S.

21. The Bay of Talcahuano at 36°45' S.

22. The Bay of Valparaiso at 33° south latitude.

23. The Bay of Coquimbo at 30° south latitude.

.24. The Bay of Antofagasta at 23?30' s. Br..

25. The Bay of Mejillones, at 23? latitude, which has excellent anchorages and is easily accessible by the Humboldt Current, giving access to an area that has been the seat of great cultures and is rich in valuable metals.

26. Arica at 18^ s. Br., which has a good roadstead and gives easy access to the interior.

27. The roadstead of Ilo at 17°30' south latitude, for the same reasons. It is the port of the Osma Valley, rich in ruins of the Tiahuanaco culture.

28. The Bay of Pisco at 14? s. Br. and its Paracas peninsula with the three-Zack or Armleuchter and his unsolved prehistoric mysteries.

29. Callao at 12° south latitude.

Now begins a zone in which archaeological arguments are combined with evidence from

Place names and the latitudes of Marinos and Ptolemy coincide

fen.

30. Between Chimbote and the mouth of the Rio Santa at 9° south latitude, a site of very ancient culture is called Huaca de los Cbinos or Tomb of the Chinese (102), which perhaps reminds us of Hormos Sinon, which Ptolemy placed in exactly this latitude.

31. Another place, also called Huaca de los Cbinos, is near Trujillo, at 8? s. Br. in the area of Chan-Chan, the old capital of the Chimá Empire, which was very well supplied with irrigation canals (100, 191 127, 136 and 119 104-6). Chan-Chan is also the name of a city north of Lake Lop Nor in Chinese (Eastern) Turkestan (95 28ff.), which is mentioned in the Annals of Han between 114 BC and 225 AD as a stop on the Silk Road between China and Persia through the north of the Tarimbek. This area was inhabited at that time by the Indo-Germanic people of the Tocharians. The trade route was well known to Marinos of Tyre. Were the founders of Chan-Chan, who came across the sea (135), Tocharian Indo-Europeans who came here as “Chinese,” and perhaps even Cbimu = Chinese?

32. Lambayeque, an old metalworking centre, was suggested by Ibarra Grasso (106). This area reached a high level of development very early on and had an excellent network of canals (119-147). The Chinese immigrants who came here at the beginning of the 19th century are said to have been able to communicate perfectly with the Indians in this area (135-7 ff.).

33. The bay of Sechara, between Punta Aguja and Punta Nermete, opposite the fertile valley of Piura, a seat of ancient culture, offers excellent anchorages. |

34. As a last resort to the north, the Bay of Guayaquil, where there is no lack of good anchorages or ruins of very old and little-studied cultural sites. It lies between 3 and 4^ s. Br.

XIII.4. The current status of the Kattigara problem

As in the case of the Asian theories, the large number of possible localizations of Kattigara in South America indicates the weakness of each of these hypotheses, but certainly does not diminish the value of the underlying idea, which is based on the identification of the dragon's tail with South America throughout the history of cartography until the end of the 16th century.

Of the 21 possible locations given for South America, each deserves its own study from a geographical, hydrographic, prehistoric, early historical, economic, archaeological, mineralogical, ethnographic, toponymic, linguistic, etc. perspective. This work would take several generations and would exceed the scope of this book.

This paper is intended only as an introduction to a new view of the problem, which is geographical in origin but extends over a large number of sciences.

The possibilities in the north of Peru include the existence of highly developed cultures in antiquity, especially the Chimu and the pre-Mochica cultures in general.

The central coast of Peru, in addition to magnificent cultures, still has names that recall the Chinese mentioned by Ptolemy and in the Annals of Han.

The assumptions for southern Peru can be based on the brilliant and unknown past of Tiahuanaco, on the enigmatic geoglyphs in the plain of Nazca, on the candelabrum of Paracas, all full of riddles to which there is as yet no answer.

The north of Chile still offers good connections with the Tiahuanaco area.

The south of Chile best corresponds to the conditions for voyage with the South Pacific current, and appears on Hammer's map, confirmed by the method of the distortion grid, strangely accurate in most of its details.

Each of these theories has foundations too good to be ignored, but none is based on obvious and indisputable evidence.

I do not claim to have solved the riddle of Kattigara, the Hormos Sinon of Ptolemy (170), the coastal fortress of Tomaschek (201), the most distant city in the world of Enrique de Gandia (67), or the anchorage of the Indian traders according to my interpretation, to have solved.

The ruins of Troy have been searched for in vain for centuries and 'found nothing'; it was concluded that it was a gendáre in the truest sense of the word, a city imagined by a poet. , le- Then Schliemann discovered it, without being an archaeologist or historian by profession. Similarly, centuries may pass before the ruins of Kattigara are found, or before they are identified with those already known, or even more simply: before one has a precise idea of the location of his anchorage.

I have gathered new elements of information and new theories that make the Hormos Sinon file more comprehensive and may help to determine this location.

In the abundance of evidence and the lack of proof, the Kattigara enigma is a typical case of early history and early geography.

XIV. The exploration of South America in antiquity

XIV.1. Excellent maps from known sources

I have so far gone through the entire history of cartography of the European Renaissance, the most interesting part of the Arab and Christian geography of the Middle Ages, as well as of classical Greco-Egyptian antiquity. Everywhere I have found South America in the shape of the dragon's tail, either in whole or in part, barely indicated or very precisely drawn. The most perfect map is without doubt Hammer's London Ptolemy map of 1489, on which the river network is shown more completely than on any other map before 1850. Al-Hwarizmi's representation is clearly inferior to that of Hammer, but is very remarkable for its time. Finally, Kattigara by Marinos of Tyre shows the beginning but actual knowledge of an anchorage on the Pacific coast of South America visited by the Chinese.

What were Hammer's excellent sources of information? Where did al-Hwarizmi get his geographical information? Who told Marinos of Tyre how to get to Kattigara?

Only the third question has a proven answer, but it is a deceptive one, because it consists of only one name: Alexandros, a person about whom absolutely nothing is known, except that he is the source of Marinos' information about the journey from Zabai to Kattigara, two places that cannot even be located with any certainty. All hypotheses about Alexandros are completely lacking in foundations. A typical case of early history: probable hypotheses without any proof.

The correction of Hammer's map, the presence of Tierra del Fuego on an Arabic map of 833 and the explanation of Hormos Sinon as one of point on the South American coast, whose name Kattigara seems to be of Indian origin (201 47), open up new perspectives and new insights.

into the problem of the early discovery of South America.

Over which ocean were these early discoveries made?

On almost all maps, and especially in those of Hammer, al-Hwärizmi and Marinos of Tyre, South America occupies a place in the far east of the world. It therefore seems obvious to me that the explorers or merchants who provided the relevant information arrived there via the east of the Eurasian world, that is, via the Pacific Ocean. The problem is therefore the transpacific discovery of South America.

Al-Hwärizmi had at his disposal the library of the Dar al-Hikma in Baghdad, the best in the Arab world, which was at the height of its power and culture at that time. Baghdad had connections to India, China and the Mediterranean and could therefore benefit from the scientific heritage of these three areas.

benefit from her culture.

Hammer worked in Florence and Rome in the 15th century. Florence and Venice had a monopoly with Alexandria on the trade in spices that came from the Far East. On the other hand, in the 13th and 14th centuries the Holy See received reports from time to time from the Franciscan missions in China, from Rubruk to Montecorvino, which could contain geographical information.

So I came up with three hypotheses: a Chinese one, a Phoenician one and an Egyptian one.

XIV.2. The Chinese Hypothesis

The Chinese hypothesis is based mainly on the expression of Ptolemaios: Kattigara, anchorage of the Chinese.

As already mentioned, the southern branch of the Pacific's ring-shaped ocean current was used for the journey; the same ring-shaped ocean current could also be used for the return journey from Peru to the Moluccas, under a much milder climate than on the outward journey.

This hypothesis, derived from the Alexandrian document, finds support in Chinese annals, especially those of the Han dynasty, in which it is reported that in 219 B.C. the Emperor Chi Wang-Ti sent an expedition of young men of both sexes to a wonderful country far to the east, beyond the seas, called Fu-Sang. The young men remained there and lived happily.

It is quite natural to compare these details with the Peruvian place names Huaca de los Chinos or Tomb of the Chinese (191) and others mentioned in the previous chapter.

about the Chinese immigrants in Peru, Chan-Chan, etc.

This hypothesis of Fu-Sang is confirmed in the Annals of the Liang Dynasty, in which, in Book 54, Ma-Twan-Lin relates that the bonze Hui-Chen returned from Fu-Sang in 499 AD (88 II 33—41). He describes this country, which lies 20,000 li to the east, with its houses, customs, trees and animals. Hui-Chen expressly states that Fu-Sang lies on the east coast of the Eastern Sea, that is, on the east coast of the Pacific (186 18-21).

Furthermore, the Universal Encyclopedia of China (San-ts'ai t'u-hui) shows us the representation of a man from Fu-Sang milking a llama (Fig. 48) (186 27), an animal that the inhabitants of Peru had been breeding since the 3rd millennium BC (166 and 210).

The study of Fu-Sang is not new for European orientalists. The French Jesuit Joseph de Guignes identified it with America in 1761, but took the remark “east of China” quite literally and wanted to look for Fu-Sang in Mexico (81).

In 1841, Carl Neumann, professor of oriental languages and History at the University of Munich, a German translation of the part of the

Annals, who referred to Fu-Sang and believed that it was Mexico (154). The same theory was put forward in 1844 by Hippolyte de Paravey (162) and in 1865 by Gustave d'Eichthal (47). The Canadian Charles Leland translated Neumann's German translation into English (130). Without doubt the most complete study is that of Edward P. Vinning (203), who draws on de Guignes' theory and supports it almost lavishly with new and careful arguments. Not to forget the work of Hervey de Saint Denis (97).

Father de Guignes' theory was fiercely opposed by the Orientalists, who preferred to consider the 20,000 li as an exaggeration and sought Fu-Sang partly in Japan and partly in Sakhalin. Among them we should mention Julius Heinrich Klaproth (116), Vivien de Saint Martin (204), EV Bretschneider (20), Gustav Schlegel (186), who depicted the Lama without recognizing him, and others of lesser importance such as Dall, Müller and Chamberlain.

Today, no one doubts the possibility of crossing the Pacific with large Chinese ships.

XIV.3. The Egyptian Hypothesis

Of all the hypotheses, the Egyptian one refers to the oldest voyages, because it identifies the dragon’s tail, or at least Peru, with the country

Point (88 1 5—13).

The first known voyage to this region was organized by the Pharaoh Sahuré of the Fifth Dynasty, around 2500 BC. His ships brought frankincense, myrrh, gold, silver, precious woods and slaves from Punt and the numerous countries in which they had stopped. It would be a mistake to believe that all these products came from the land of Punt, and the problem would be to find a country on earth that could provide all these riches. The travel stations may be the place of origin of a large part of them.

The Pharaoh Asa (Isesi) followed Sahuré's example around 2400 BC and also sent his fleets to the land of Punt.

A princess of the VIth Dynasty took red lip gloss made using antimony, a metal completely unknown in Egypt and its neighboring countries, with her to the grave for her journey to the realm of the dead.

From the same period comes the tomb inscription of Khnemhotep, a helmsman from Elephantine who made the voyage to Punt eleven times (96).

During the 9th Dynasty, Pharaoh Seandkare organized new, successful expeditions to this mysterious land.

The best known journeys are certainly those ordered by Queen Hatshepsut (called Makara, 1501—1482 BC), whose history is based on the

Reliefs of the temple of Deir el-Bahri, near Thebes, which she had built in honor of Amun-Re (45, 127, 153, 190, 214).

Hatshepsut's main expedition consisted of at least five large ships (Fig. 49), each with 30 rowers. It set out from a port on the Red Sea in 1493 BC and returned after three years.

One of the inscriptions of the temple of Deir el-Bahri states that the inhabitants of Punt asked the Egyptians: 'How did you come to this land unknown to men? Did you come by the path of heaven, or did you travel by water across the great sea of the land of the gods?' (88 I 5).

Why should one not be tempted to connect these words with the journey across the Pacific and the long, straight lines and paths in the desert of Nazca? (172)

According to the account of Ramses IV in the Harris Papyrus in the British Museum, Pharaoh Ramses III sent an expedition of 10,000 men to Punt in 1180 BC.

The last known expedition took place in the middle of the 2nd century BC. It was prepared in Egypt with the collaboration of Hindlers and financiers from Massilia, today's Marseille (164).

The Egyptian ocean-going ships were about 30 m long and had a displacement of about 85 tons, the same as the caravels of the 15th century AD. Their flat bottoms allowed them to travel quickly when the wind was favorable. When there was no wind, the rowers came into action, which allowed the voyage to continue without having to wait for a favorable wind.

Egyptologists do not agree on the location of the country of Punt. Some suggest Eritrea, others Somalia, Zimbabwe, Hadramaut or even India (34).

All these places are far too close to the Red Sea to justify the duration of the journey: three years in all the places recorded by Egyptian documents. I have therefore taken the liberty of suggesting a new interpretation (56).

As already mentioned, my attention was caught by the question of the inhabitants of Punt to the Egyptians: "Did you come by the path of heaven, or did you travel by water across the great ocean of the land of the gods?" No sea on earth deserves the name of Great Ocean more than the Pacific.

fik, and on the shores of the Pacific nothing offers a better way of arriving by the sky path than the mysterious geoglyphs in the form of geometric figures in the desert of Nazca, for which no one has yet been able to give a satisfactory explanation. The interpretation is bold, but it is better to have a bold theory than none at all.

The land of Punt, a place of great wealth and ancient culture, could have been located in Pe-ru in the Puno region on the shores of Lake Titicaca. Today

70% of Peru's gold production is mined there, as well as silver, antimony, mercury, zinc, tin, cobalt, etc. This area has old gold mines and very old antimony mines, the exact age of which archaeologists have not been able to determine.

The similarity of the names Punt and Puno is remarkable. It is not

There is no evidence for identification, but it is one element that supports it. And it is strange that a nearby hill called Huansopata, which sounds similar to Hatshabepsut, contains pre-Inca tombs and ruins that, according to the very few archaeologists who have examined them, belong to a culture much older than that of Tiahuanaco.

The boats from Lake Titicaca made of reeds (108 304 ff) are so similar to those of ancient Egypt that Thor Heyerdahl brought the men who built his papyrus boat Ra II on the banks of the Nile from Puno. Puno is only 240 km as the crow flies from the Pacific and the ruins in the areas in between offer belong to the same pre-Inca culture (108 90). I would like to remind you that Lake Titicaca is undoubtedly shown on Hammer's pre-Columbian depiction of Ptolemy.

The theory of Puno certainly deserves a study of its own and, given the current state of the matter, it seems to me to be at least as good as the other localizations for Punt.

XIV.4. The pbonic hypothesize

The reputation of the Phoenician seafarers was so great in the 10th century BC that King Solomon asked King Hiram of Tyre to send him experts to build a deep-sea fleet in the Red Sea and to send helmsmen

and sailors to lead this fleet to the land of Ophir (5 and 105, 304).

The problem of locating Ophir is very similar to that of the country of Punt.
Both areas are located “very far to the southeast.” In both cases, the journey begins in the Red Sea and takes three years there and back.

The products brought from Ophir and the stopovers correspond for the most part to those which the Egyptians found in Punt and the stopovers there: gold, silver, precious woods, spices, slaves, etc. (9 and 88 I 28--39).

As Solomon was the son-in-law of the Pharaoh, it is quite natural that he should have obtained from him the information necessary for organizing an expedition to the land of Punt or a nearby region, in the same way that centuries later the English and French tried to establish their own colonies in Africa, Asia and America near those of their rivals. The Phoenicians were already supplying pilots and crews to the Egyptian fleet before they offered the same services to the Jews.

Since they are familiar with the problems and advantages of seafaring and trade in the Orient,

They must have carried out their seafaring before this emigration, from the Persian Gulf, no doubt hidden in Persian expeditions. On the other hand, Mediterranean Phoenicia was incorporated into Cyrus' Persia from the 6th century BC, and the Phoenician sailors could not

Countries they visited on behalf of foreign kings, engraved or painted (35).

I was led to this Phoenician hypothesis by a series of objects discovered in various parts of South America, generally considered to be Phoenician.

finds, mostly inscriptions.

Eduardo Habich has identified Phoenician ships on the inner steles of the Temple of Sechin in the Casma Valley on the Peruvian coast (106 176). The ruins are believed to be 3,000 years old. Other neighboring stone blocks show a sea-going ship and a sextant (200).

Even more extraordinary are the discoveries of Bernardo Silva Ramos.

This author, President of the Geographical Institute of Manaos, has visited the Ama-

roamed the zonal jungle for more than 20 years and found over 2800 rock inscriptions photographed and copied, of which he claims that most

have refused to examine and investigate these inscriptions and have limited themselves to attributing them to modern jokers.

I believe that it would not be so difficult to distinguish an inscription made 20 years ago from one carved 20 centuries ago. And what modern scientist would be so crazy as to spend a large part of his life on it. Pseudo-Phoenician inscriptions in the depths

The confusion is even greater since Professor Jacques de Mahieu claims that these inscriptions are written in Old Danish, in runes, and date from the Middle Ages (135).

On the other hand, one cannot doubt the ability of Phoenician ships, whether in the service of Egypt, Jews or Persians, to make a transpacific voyage by taking advantage of the ocean currents and the regular winds. A seafaring people could live much better on the high seas than

the French doctor Dr. Alaÿn Bombard, who in 1952 crossed the Atlantic in 95 days on an inflatable life raft that was 4.5 m long, 2 m wide and 0.5 m high and lived exclusively on what the sea gave him.

Egyptian ships sometimes reached 6,500 tons, such as those of Ptolemy IV Philopator (222-205 BC), and the Jewish historian Flavius Josephus (37-100 AD) speaks of ships that carried, in addition to the crew, 600 persons and trade goods (96,159).

Ibarra Grasso has studied the merchant ships of the Eastern Mediterranean from the 3rd century century BC with ships depicted on Mochica pottery from northern Peru (106 166). These boats are practically identical and are mainly characterized by a bridge from bow to stern, loaded with clay jars for wine, oil, etc. This type of ship is still in use today in the Aegean and in use in Indochina, but as far as we know it was never known in Peru, except on Mochica pottery. Professor Ibarra Grasso has given the only known interpretation for it. I

The Egyptian or Phoenician ships sailing from the north of the Red Sea had to follow the traditional route via Malabar, Taprobana and Chryse Chersonesos to Zabai in northern Borneo, from there to the South Pacific West Wind Drift and following the Humboldt Current to Katti-gara, which I presume to be in Peru; the return journey would be by using the South Equatorial Current to Borneo and from there the same route. The length of this crossing is approximately 39,000 km for the outward journey and 34,000 km for the return journey, making a total of 73,000 km.

When Herodotus wanted to calculate the length and breadth of the Black Sea, he estimated the speed of the ships of his time to be 70,000 orgyias by day and 60,000 orgyias by night, a total of 130,000 orgyias in 24 hours (89 IV 86).

This allows us to calculate the actual travel time of the journey to Kattigara. The 130,000 orgyien correspond to 240 km, which Hennig (88 1 94) reduces to 200 km in order to take into account the accidents of sea travel. On this basis, the total journey of 73,000 km corresponds to an actual travel time of 365 days. The total duration of the journeys to Punt and Ophir (5, 1 Kings

17 Orgyia, ancient Greek measure (fathoms) 1 Orgyia = 1.85 m

10, 22) of 3 years, the travelers had two years for the intermediate ports, the stay in Kattigara and the time lost due to storms and repairs. I do not take into account the adverse winds, but I also ignore the favorable winds and the great advantage of the ring current in the South Pacific.

This calculation proves that the completion of the journey to Kattigara in three years was entirely within the possibilities of that time.

XV. The Secret of the Dragon's Tail

The object and aim of early history, and one could say its great hope and wish, is to cease to be early history and to turn into history. In other words, early history deals with historical problems for which it is currently impossible to find solutions within the framework of history according to the principles of history.

te due to a lack of documents and evidence. In this case, prehistory formulates hypotheses, but it does not limit itself to them. It uses these hypotheses as clues in the search for new evidence, which from time to time acquire probative value. In addition, prehistory examines and re-examines historical facts and documents from the perspective of a new hypothesis and often comes to conclusions which find their confirmation in other facts and documents which have not yet been linked to the problem under consideration. These new connections strengthen certain hypotheses and destroy others. When the evidence sought is finally found, one leaves the realm of prehistory and enters that of history.

Early cartography, which is closely linked to early history, formulates conjectural interpretations for maps that go beyond the clear and unambiguous representation of the lands that were well known at the time the map was made. In the light of these hypotheses, it reinterprets the early cartographic and early historical facts. In some cases, it finds evidence for its hypotheses and to a certain extent the problem under consideration passes from early cartography to cartography.

Likewise, in this study I have proposed interpretations of maps or parts of them which classical cartography could not explain and which I simply dismissed as errors. In numerous cases I have formulated several hypotheses, each based on real and reliable facts and documents, but not sufficiently to prove the correctness of my interpretations.

In other cases, my new interpretation leads to new obvious cartographic facts, so that my thesis is thereby firmly proven.

For the history of science, I have shown that the knowledge of the identification of Megas Kolpos or Sinus Magnus and the Pacific Ocean was preserved in the humanistic world until the 19th century, while it was lost among cartographers since the third quarter of the 16th century.

The recognition of the dragon's tail's constriction network and the complete identification of all the major rivers of South America on Hammer's Ptolemy map of 1489 are the obvious proof of the correctness of my interpretation. If it were only a matter of a few rivers, their correspondence with reality could be a coincidence. But in the case of the

The shape, orientation, size and position in relation to the coasts of the Paraná-Paraguay system, which is unique on Earth, exclude any chance. In the case of rivers, each is evidence of the other. Finally, the method of the distortion grid applied to the dragon's tail confirms the hydrographic analysis and completes it by identifying other lakes, rivers and capes. It can therefore be stated that the dragon's tail on Hammer's Ptolemy map has passed from early cartography to cartography.

The still fresh memory of the Vinland map purchased by Yale University, which was supposed to be proof of the discovery of North America by the Vikings, but which was then revealed to be a forgery by an analysis of the ink used, also raises the possibility that Hammer's maps could have been forged. In my opinion, this view cannot be defended, because it would have been necessary to secretly make the same changes to the map now in the British Museum's possession and to that of the Leiden Central Library.

Besides, what purpose would have been used to falsify these maps? To show that the Dragon's Tail is South America?

This equation was part of the geographical ideas of Christopher Columbus, Amerigo Vespucci and some other sailors of the same time.
But none of them could have added to his map the headwaters of the great rivers of South America, which were completely unknown to them.

No forger of the 16th or 17th century could have drawn the Patagonian rivers Colorado, Negro and Chubut, because their discovery and exploration only dates from the end of the 18th and the beginning of the 19th century.

The identification of the dragon's tail with South America was forgotten at the end of the 16th century and remained so until its rediscovery by Enrique de Gandia in 1942 (65). By this time it was already too late for a falsification of the maps of London and Leiden.

Al-Hwarizmi's map belongs to the Arab world, which is very different from the European and Mediterranean world in which Hammer worked. Al-Hwarizmi's dragon tail has so many elements in common with Hammer's that it is undoubtedly the same peninsula, South America. Al-Hwarizmi's dragon tail therefore also enters cartography from early cartography.

The identity of the western coast of South America at Ptolemy and Marinos of Tyre was known and accepted by cartographers between 1500 and 1574, and it has recently been re-proven by Ibarra Grasso and Enrique de Gandia.

The early historical repercussions of these discoveries are very significant. The cartographic quality of Hammer's depiction of South America is clearly superior to all other maps that followed until the middle of the 19th century.

superior, especially with regard to the Patagonian rivers Colorado, Negro, Chu-but and Grande in Tierra del Fuego. The mere fact that this map was drawn in Europe before the first voyage of Christopher Columbus proves that

Expeditions have taken place that, before Columbus's actions, discovered the entire interior of the continent and revealed its details. Here are

We are completely in the field of prehistory and it is impossible for us to pass on to history, because the numerous hypotheses that I have collected or put forward so far have not yet led to definitive proof, although they can be supported by numerous archaeological, linguistic, ethnographic, etc. elements.

One can also speak of a prehistoric involvement in the depiction of South America and especially the Patagonian Strait and Tierra del Fuego on the Arabic map from the 9th century.

Equally important is the prehistoric problem raised by the representation of the American coast on ancient maps.

Three periods in the history of the South American

Early cartography. Marinos of Tyre, in the 2nd century, has a vague idea of some points on the coast. Al-Hwarizmi, in the 9th century, knew the general shape of the South American peninsula with its north-south orientation and the island character of Tierra del Fuego. Hammer, in the 15th century, correctly represents the interior river network, as well as the capes and peninsulas of the Atlantic coast in detail.

In order to formulate hypotheses about this information in three sections, it would therefore be necessary to assume three groups of spatial exploration in time, three groups of events in the early history of navigation that could have provided the cartographers with the right information, few in Marinos' case but very rich in Hammer's, which allowed them to draw their maps.

The historical part of the information obtained by these cartographers consists of only one name: Alexandros; we speak of historical here because this name is mentioned by Ptolemy in his Geograpbiké Hypbegesis. But everything that has been written about Alexandros is nothing but pure hypothesis and thus belongs to prehistoric times. His position as a captain, his profession as a merchant, his Greek origin and his identification with Polyhistor are also prehistoric. These are possible, even probable, but sometimes contradictory and never proven hypotheses.

sen.

My Chinese hypotheses are generally prehistoric. On the other hand, the description of the lama in the country of Fu-Sang is so probable that we can regard it as definitive, all the more so because it is accompanied by numerous favorable supplementary statements to the Peruvian hypothesis.

Now it is the turn of the Sinologists, who examine the Chinese annals under

the aspect of the new early cartographic discoveries presented by me

have to read it again.

My Egyptian hypothesis is based on arguments just as good as the competing theories.

The Phoenician hypothesis is supported not only by the controversial translations of Sÿlva Ramos, but also by archaeological discoveries in Peru. These are diverse and numerous but scattered elements, and it is certainly desirable that archaeologists working in Peru reconsider their interpretations in the light of the Phoenician theory.

I could not clearly indicate al-Hwarizmi's sources and had to limit myself to saying that he had Egyptian, Indian and Chinese information at his disposal. It is the task of the Arabists to offer suggestions and, if possible, proofs of the sources of the geographer of Baghdad.

I could not propose a theory about Hammer's immediate sources, because the possible presence of Egyptian, Phoenician or Chinese traders on the Peruvian coast in ancient times does not in any way imply that these merchants could travel across the entire continent and draw a map. Hammer's map belongs entirely to cartography, because it allows the identification of rivers, mountains and capes, but since I could not formulate a hypothesis about the expeditions that carried out the uncovering, we are not even in the field of prehistory here.

The only thing that can be done is to try to clearly list the prehistoric problems caused by the existence of Hammer's map. I have compiled them in the following way:

a) Time of the early discovery. This is the expedition that made the main contribution to the knowledge that Hammer then compiled on his map. Did this expedition take place shortly before the map was made, around the middle of the 15th century? Or before 1428, when the Infante Pedro de Coimbra brought back a world map from Italy that showed the Strait of Magellan? Or in antiquity, although it could have been the work of the Chinese, Phoenicians or Egyptians.

b) Reconnaissance of the Atlantic coast. I could not propose a solution to this problem. I know the theory of Jacques de Mahieu, who attributes this research to the Vikings (137) and numerous other interpretations from past centuries, all briefly summarized and refuted by Imbelloni (108). L. Delekat has, however, pointed out another Phoenician discovery here (35).

c) Enlightenment of the interior. Several theories compete with each other: the Egyptians according to Ptolemy and Fell, the Phoenicians according to Silva Ramos, Habich and L. Delekat, the Vikings according to Mahieu, etc. The problem is difficult because

Hammer, as already mentioned, knew all the great rivers of South America, even those of Patagonia and Tierra del Fuego.

d) The cultural center that provides information about the discovery. This problem is closely related to the previous one. If the Pharaohs knew the secrets of South America, this knowledge could have been lost, as well as the knowledge of the route to the land point, regardless of its identification with South America, just as the secrets of the pyramids were forgotten. The Phoenician merchants forgot their secret knowledge of the routes when the world situation forced them to abandon their Far Eastern voyages. The Chinese turned their expeditions into legends when internal wars put an end to their transoceanic expeditions.

set.

Time of transmission of information to Italy. I have some

hypotheses have been put forward without being able to prove a single one. The Franciscans of the Middle Ages may have received information in China and transmitted it to Rome. These reports were particularly numerous at the time when Montecorvino was archbishop. Venetians and Florentines had intensive trade relations with Alexandria in the second half of the Middle Ages and could thus have obtained information that had been passed down in secret since antiquity. All of these hypotheses are weak, but there are no others. The experts on the Near and Far East now have the floor.

f) The direct origin of Hammer's information. When this information reached Italy, it could have been accessed without great difficulty by Hammer, who worked for official circles in both Florence and Rome. His connections with the Church must have been excellent, since he had belonged to the school of Cardinal Nicholas of Cusa, the learned Archbishop of Brixen, who was very active in Vatican politics. Since Hammer lived in Florence, his relations with the city's merchants must have been even better, since merchants and cartographers shared the same interest in the secrets of the Far East, the country of origin of spices, silk and many other products.

One can see that we are dealing with a series of interrelated problems, all of which are prehistoric. One can formulate hypotheses, all of which must be possible. But one cannot ask for proof, for the simple reason that there is none.

It would be a methodical mistake to try to apply the rules of bishistorical criticism to the hypotheses of early history. One would achieve nothing but the destruction of all these hypotheses, without any advantage to anyone.

It is better to have several shaky theories than none at all. Their weakness leads us to look for new data, to derive new interpretations from old data, to reflect on hypotheses already proposed, to

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To deepen connections and seek new paths that intersect and reinforce each other. 1

In contrast to this vague prehistoric hypothesis, the cartographic reality of the depiction of South America on the maps of Hammer, al-Hwarizmi and Marinos of Tyre asserts itself. The rest remains a mystery:

The secret of the dragon's tail.

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Map 3: World map by Jacopo Gastaldi, 1562.

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Map 7: Carta Marina Nuova Tavola by Jacopo Gastaldi, 1548.

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Map 8: Globe by Gaspar Vopelius, 1542.

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: Heart-shaped card by Oronce F

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Map 10: Gotha marble globe, ca. 1533.

Map 11: Globe by Johannes Schóner, 1533.

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Map 15: Second sketch attributed to Alessandro Zorzi

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Map 17: Heart-shaped world map by Peter Apian, 1530.

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Map 18: Typus Orbis Universalis by Peter Apian, 1530.

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Map 19: Portulan by Pietro Coppo, 1528.

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Ficher-shaped world map by Jan Ruysch, 1508.

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Map 25: World map by Waldseemiiller, 1507.
Detail: East Africa and Malabar Coast.

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Map 26: World map by Waldseemüller, 1507.
Detail: Dragon tail and shifted islands

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Map 27: World map by Waldseemüller, 1507.

Excerpt: Tierra del Fuego.

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Map 28. The Nuremberg potato drawn by Doppelmayr.

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Map 29: The Nuremberg potato according to the Encyclopedia Britannica

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Map 30: The Nuremberg potato.

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Map 31: The Niirnberger I

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Map 35: The Dragon's Tail on the Ptolemy Map from Y ale

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Map 37: The river network of South America on Hammer's London Ptolemy map and a modern map.

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Map 38: Distortion grid of the European map by Willem Blaeu around 1630

Map 39: The distortion grid of South America on Hammer's London Ptolemy map.

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Map 40a: Reconstruction of the Nova Cosmograpbia per totum circulum (1440)

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Map 40c: Map from the Zeitz Abbey Library (1470). (South is at the top)

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Map 41: World map by Macrobius or his copyist.

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Map 44: India Transgangetica and the Pacific on a Ptolemy map

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Map 46: India Transgangetica and the Pacific according to Marinos of Tyre.

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Fig. 48: Man from Fu-Sang milking a lama.

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Fig. 50: Phoenician inscription discovered in the Brazilian province of Paraiba.